

National **SAFETY NEWS**

FEBRUARY 1956

This issue contains a special
Technical Feature Section

The Journal
of the AMERICAN SOCIETY
OF SAFETY ENGINEERS

Radiation Detectives



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IN THIS ISSUE

The Man Who Will Follow Us
Learning to Live with the Atom
Magnesium-Data Sheet

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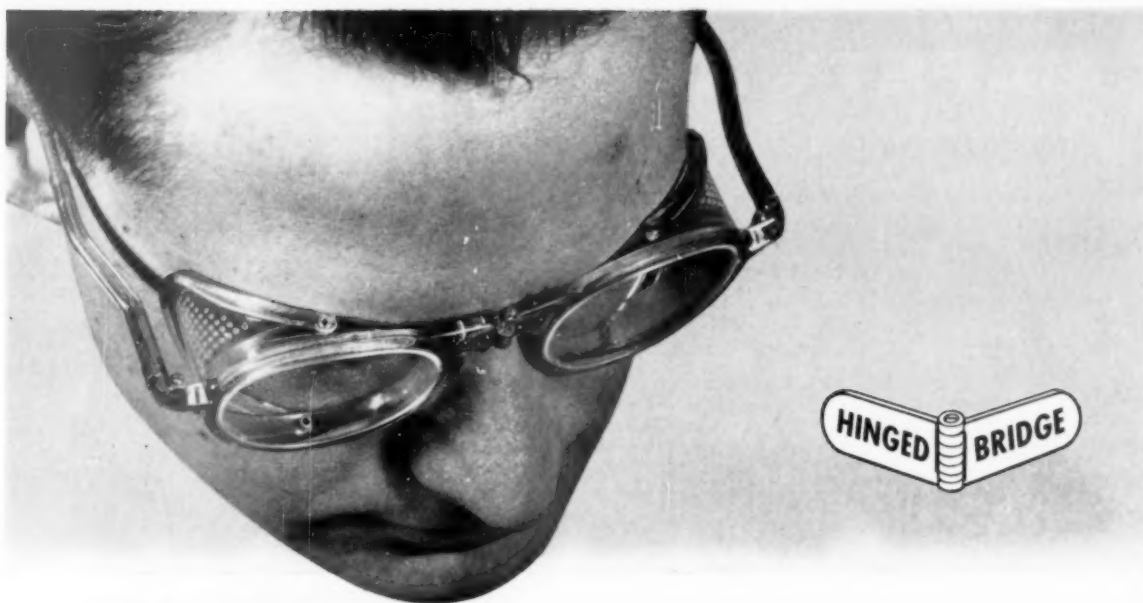
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National SAFETY NEWS

Published monthly by National Safety Council

Containing a special Technical Feature Section

The Journal of the

AMERICAN SOCIETY OF SAFETY ENGINEERS

Vol. 73, No. 2

FEBRUARY 1956

THE COVER: Work with radioactive tracer material is supervised by an industrial hygiene engineer who measures radiation intensity with a portable radiation counter. Metal wrist badges contain special photographic film for recording individual exposure. (Westinghouse photo)

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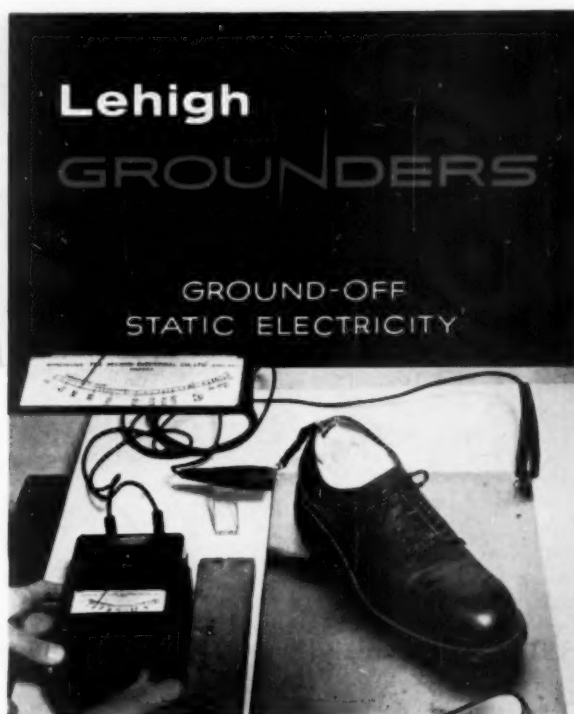
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THE ACCIDENT BAROMETER



Prepared by the Statistics Division,
National Safety Council

ACCIDENTAL DEATHS in October totalled 8,200, an increase of 400 from October 1954. There were increases in motor-vehicle and home, a decrease in public non-motor-vehicle and no change in work accident deaths.

The total for 10 months was 75,700, or 2 per cent above the 1954 comparable total of 74,400. Aside from a reduction in home accident deaths, all classes showed increases over 1954.

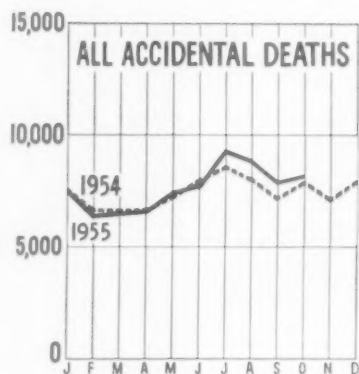
Home Deaths

October deaths from home accidents numbered approximately 2,300, an increase of 5 per cent over October 1954.

The January-October total was 21,700, a reduction of 4 per cent from 22,600 in 1954. There were large decreases in deaths from mechanical suffocation and poisonings; small reductions in firearms accidents and burns; and no change in falls. Aside from no change for persons 45 to 64 years, each age group showed some reduction from 1954 with the largest change recorded for children under 5 years old.

Motor-Vehicle Deaths

The October total of motor-



	1955	1954	Change
October	8,200	7,800	+5%
Ten Months ...	75,700	74,400	+2%

vehicle deaths was 3,920, an increase of 12 per cent over 3,500 in 1954. Compared to 1953, it was an increase of 8 per cent.

Deaths for the 10 months totalled 30,980, an increase of 7 per cent over the 1954 total of 29,080. The 10-month death rate per 100,000,000 vehicle miles was 6.3, no change from 1954.

Of the 45 states reporting for 10 months, 10 had fewer deaths than in 1954, 2 had the same number and 33 had more deaths. Reporting cities with populations of more than 10,000 had an increase of 20 per cent for October and 5

per cent for the 10-month period. Regional changes from 1954 in the 10-month death totals were:

North Atlantic	+ 8%
South Atlantic	+ 8%
North Central	+ 5%
South Central	+ 7%
Mountain	- 2%
Pacific	+10%

Work Accidents

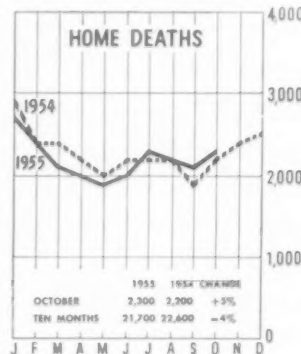
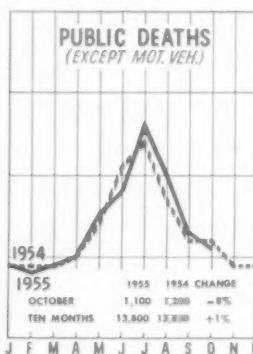
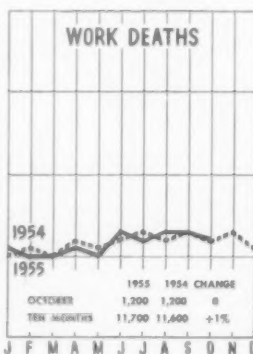
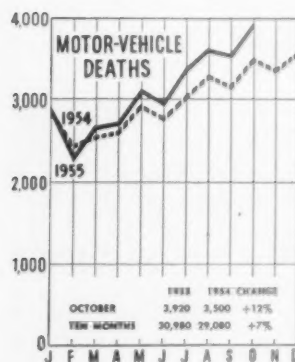
Deaths from work accidents in October numbered about the same as in 1954—1,200. The 10-month death total was 11,700, an increase of 1 per cent over 1954.

The October frequency rate per million man-hours in 18 sectional accident prevention contests conducted by the National Safety Council was 6.11, an increase of 10 per cent over October 1954. The 10-month rate was 5.80, an increase of 3 per cent. The October rate for plants in community council contests was 5.99, a reduction of 4 per cent from October 1954. The 10-month rate was 5.49, a decrease of 11 per cent.

Public Deaths

There were approximately 1,100 deaths from public non-motor-vehicle accidents in October, or 100 fewer than in 1954.

The 10-month death total was 13,800, an increase of 1 per cent over 1954. Increases in fatal burns and drownings were nearly offset by decreases in falls, firearms and transportation accidents. There were increases in deaths of children under 15 years and persons 65 years and over and decreases in the other age groups.



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| <input type="checkbox"/> in underground cable manholes. | COOLING: | <input type="checkbox"/> stirring up stagnant air wherever men are working or material is drying. |
| <input type="checkbox"/> in aeroplane fuselages, wings, etc. | <input type="checkbox"/> motors, generators, switchboards. | <input type="checkbox"/> drying of walls, sheets, etc., after treated with coating material. |
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THE SAFETY VALVE



Nothing human is alien to me

—TERENCE

Safe in Church?

MY RECORD as a church member, I confess with shame, leaves something to be desired. Oh yes, my attendance record has been slightly better than average, if you include the Christmas and Easter people. Financially, I've been a modest contributor. I've served on the board and taken part in the every-member shakedowns.

But on one point, something quite close to my job, I've been shamefully negligent. I'm referring to the physical safety of the church.

Several years ago I watched uneasily a Christmas pageant in which young girls in filmy gowns were carrying lighted candles in a processional. What did I do about it? I made a few mild comments but didn't want to be a nuisance. Since then I have merely stayed away from such pageants.

When the old church became inadequate and construction was started on the new one, services were held in the parish house. Easter and Advent congregations put quite a strain on its capacity. Sometimes when I should have been listening to the sermon I found myself wondering how long it would take to empty the building through the inadequate exits. But again, I didn't want to be a fanatic and it is easy to lapse into the comforting feeling that the Lord is mindful of His own—a state of mind not supported by NFPA records.

What started me thinking along this line was an article in *The Pastor*, a magazine for ministers, entitled "Your Church May Be Dangerous," by C. O. Jackson, professor of physical education at the University of Illinois, and a safety-minded layman.

Professor Jackson's church, the First Methodist of Champaign, Ill., had a collection of hazards that wouldn't be tolerated in any well-run shop. Increasing church and Sunday School attendance was bringing new complications. Traffic, a serious problem for centrally located churches, was causing congestion and hazard to adults and children.

First step was the appointment of a committee and this committee really worked. They went through the church building with a fine-tooth comb for hazards. They conferred with the police and fire departments on traffic and fire problems. They carried on a persistent campaign of education for teachers, custodians, and members. Fire drills were organized in the Sunday School.

Our own church is a new one (1952) and, so far as I've been able to discover on casual observation, the architect and building committee did a good job in keeping it reasonably free from built-in booby

traps. Exits, stairways, handrails, lighting, and the like, appear satisfactory. The kitchen looks reasonably safe.

However, I haven't looked around the dark corners of the basement to check on the sexton's house-keeping nor in the storeroom where props for amateur dramatics are stored. I don't know whether there's a first-aid kit in the church office. Next Sunday (if we don't have company) I'll look over the fire extinguisher situation.

Four of my fellow staff members at NSC headquarters are also affiliated with the church and there are several insurance men in the congregation. Really, there's no excuse for not having a safe church.

I'd like to see a copy of Professor Jackson's article in the hands of every elder, deacon, vestryman, and clergyman.

* * *

One of my neighbors reports that a friend took him for a ride in one of the new glamor power plants and pushed the speedometer up to 135 mph. There must be a limit to what can be expected of seat belts, crash padding and guardian angels.

In This Issue

Twenty-five years ago the safety men didn't have to worry about the atom and many of today's problem chemicals were unknown. What will his job be like in 1980? There will be new problems, of course, but an open, inquiring mind and sound training in the basic subjects will enable him to keep pace with industrial development. (Page 18)

* * *

The atom, it seems, is here to stay and it is going to have a big part in man's future. We can put it to work for us just like fire, explosives, electricity, and a variety of poisons. (Page 20)

* * *

The really hazardous substances used in industry are those whose properties are not yet fully understood. There's nothing insidious, however, about corrosive irritants. Their qualities are quite obvious and they are handled in enormous quantities without undue risk. (Page 24)

* * *

A doctor with a sense of humor and a gift of words can turn out an article that is both instructive and entertaining. The medical profession provides a wealth of background material—both clinical and human. You'll enjoy this article and get some rather unconventional ideas on keeping minor injuries from growing into major ones. (Page 26)

* * *

The head of a small plant has to develop a lot of skills but he is closer to his men and to shop problems. From the standpoint of accident prevention that can be a big advantage. (Page 28)

Carman Fish

Workmen in Bare Feet!

ridiculous yes, . . . but shoes without safety steel toes can be just as risky

Today you can select safety shoes for your workers ranging from the finest dress oxfords to heavy duty work boots . . . all having the maximum steel toe protection afforded by the new improved WINGUARD steel toes.



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Left: protective clothing exhibit featuring "Butch" dressed in mine rescue equipment. Above: Under Secretary of Labor Arthur Larson (right) explains respiratory equipment to Alejandro Huizi-Aguilar, commercial counselor, Embassy of Venezuela.

Labor Department Exhibit Tours Latin America

LATIN Americans are getting a first-hand look at what the best-dressed American worker is wearing these days thanks to a mobile safety exhibit developed by the U. S. Department of Labor under the sponsorship of the International Cooperation Administration (ICA).

Highlight of the 65-foot-long exhibit is "Butch," a model attired for mine rescue work, who pre-sides over the more than 2,000 pounds of safety equipment and machinery contributed by 100 U. S. manufacturers. The extended tour is the result of requests from a number of companies for a demonstration of the practical side of creating safe working conditions in the United States. A companion display will be built and shown in Asia and the Far East.

Showings in Latin America will be handled by missions of the ICA and a touring safety engineer and will include labor conventions, industrial expositions, national safety congresses, trade association meetings, and vocational schools.

Eight safety areas are featured in the display: head, eye, and face

protection; protective clothing; respiratory protection; machine guarding; standards; plant equipment maintenance, fire protection, and environmental testing instruments.

One exhibit labeled, "Improve Worker Conditions," lists steps necessary to develop a safety program for a country:

1. Determine the need for a program.

2. Develop accident and injury statistics.

3. Conduct training courses for engineers, technicians, supervisors, and workers.

4. Organize a National Safety Council.

5. Develop safety standards.

6. Organize a safety congress.

Before leaving the country in December, "Butch" and his equipment were displayed in the Labor Department's auditorium in Washington. The exhibit was designed by the combined staffs of the Bureau of Labor Standards and the Visual Services Branch of the Labor Department.



Attending the exhibit in Washington were (l. to r.) Dr. William F. Russell, deputy director for technical services, ICA; Senor Huizi-Aguilar; Mr. Larson, and John K. Meskimen, director, S/LAF, ICA.

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AROUND THE COMPASS

ACTIVITIES • PROGRAMS • EVENTS

Compiled by Field Service Department, NSC



Streit Joins Field Service Department

Paul Hill, manager of the Field Service Department, announces the appointment of Philip N. Streit as a new member of the Field Service staff to work at Chicago headquarters. Mr. Streit has spent the last eight years as an independent public relations representative, organizing and directing projects and financial programs for various civic organizations and other groups throughout the United States and Canada.

The last three years have been spent on special financial projects for chapters of the National Safety Council and other safety groups. Among these were the Kansas City Safety Council, St. Joseph (Mo.) Safety Council, the Citizens' Safety Council of Tulsa, Okla. and the Safety Council of Greater St. Louis.

He has had broad and successful experience in the field of finance and expects to spend considerable time consulting with chapter managers on money-raising problems.

Mr. Streit is a native of Iowa and a graduate of Iowa State College at Ames. He saw active service during the war. He is married and has a son ten months old.

"Safety Oscars" Presented

The Northern California Industrial Safety Society has again awarded its annual "Safety Oscars" to several citizens in the San Francisco Bay area "who have contributed the most to safety," in the opinion of its awards committee.

The awarding of Oscars was begun by the society in 1953 and has continued on a yearly basis. The 1955 winners were O. A. Jeschien, safety chairman of the

Berkeley Kiwanis Club, Berkeley, Calif.; E. W. Bullard, president, E. D. Bullard Company, San Francisco; James Grady, radio station KCBS, San Francisco, and Dave Allan, Westinghouse television station KPIX, San Francisco.

Emphasis on Industrial Safety

An unusually strong industrial program is planned for the 17th Annual Southern Safety Conference and Exposition to be held March 4-6 at the Biltmore Hotel, Atlanta.

Thirteen industrial and transit sessions are scheduled: Nurses, Aeronautical, Commercial Vehicle and Transit, Construction, Fertilizer, Fire Prevention, Metals, Mining, Petroleum, Railroad,

Textile, Utilities, and Wood Products. School, Farm, Home and Traffic sessions will also have proper emphasis.

The Southern regional meeting of the ASSE is scheduled on the program. A meeting of Southern safety council managers will be led by Charles E. Doerler, manager, Louisiana Safety Association, Shreveport. Also a meeting of the Federal Safety Councils will be held.

W. L. "Bill" Groth of Richmond, Virginia, is again the executive director of the conference and the official host is the Atlanta Traffic and Safety Council.

Small Plant Safety Emphasis

Recognition of the importance
—To page 161



Left to right (front row), James Grady, of the radio program "This Is San Francisco," station KCBS, San Francisco; Karl Schulze, president, Northern California Industrial Safety Society; Otto A. Jeschien, safety chairman, Berkeley Kiwanis Club, Berkeley, Calif. Left to right (back row), E. W. Bullard, president, E. D. Bullard Company, and "Deputy Dave" Allen, of Westinghouse TV station KPIX, San Francisco.

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safe for asphalt tile

amazing

- long lasting
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- super HIL-SWEEP**
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Super HIL-SWEEP is easy to use. Just spray or sprinkle it on mop the night before. Penetrates evenly into cotton wicks. Stays in the mop without build-up; just shake mop to release dust. Makes daily maintenance fast, simple, effective.

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• **Formulated for Asphalt Tile—**

Safe for any surface.

• **Fire-Safe, Too**

Will not freeze—yet has no flash point.

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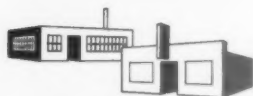
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SMALL BUSINESS and ASSOCIATIONS



By A. M. Baltzer and Robert D. Currie

Small Business Program Staff, National Safety Council

Small Business Committee Reorganization

The Small Business and Associations Committee of the Industrial Conference has undergone some major changes—and some minor ones, too. Ivan F. LeGore, safety director, Portland Cement Association, has been named to head a slate of more than 20 individuals associated with small business safety. Mr. LeGore succeeds H. F. Reinhard, secretary, International Acetylene Association, as chairman. Clyde Schlueter, manager, Accident Prevention Department, Employers Mutuals of Wausau, has been named vice chairman of the committee.

To streamline the work of the committee's activities for the smaller firms, there have been three new subcommittees established.

The Program Subcommittee, led by H. F. Reinhard, is responsible for development of new

safety services for small firms and associations, the Congress program, the Association Award, and long-range small business safety projects.

The Publications Subcommittee, led by Walter E. Montgomery, safety director, Quebec Asbestos Mining Association, is responsible for the planning of new publications, and will serve as adviser regarding existing publications such as the Association News Letter, Congress Transactions, special articles, and reprints.

The Records Subcommittee, led by Charles Zeskey, Jr., chief engineer, T. H. Mastin and Company, is responsible for the collection of statistics, cost figures, small firm success stories and examples of safety savings. This committee would advise on such matters as accident cost surveys, surveys of safety activity and would develop publicity on outstanding safety records by associations or small firms.

The Small Business and Associations Committee has recently acquired some new faces—but not new in the field of safety for small firms. Here they are:

W. M. Aicher, director of employee relations for the U. S. Brewers' Foundation, assisted the safety movement in the industry which, since 1948, cut disabling injuries in half.

T. H. Allen, loss prevention specialist for Hardware Mutuals, has been working on accident prevention in small firms directly and through associations for a long time. Tom has contributed a good many success stories of small business safety appearing on this page in past issues.

H. A. Daschner, managing director of the Pressed Metal Institute, helped PMI members reduce their frequency rate 45 per cent in the past five years through excellent safety publications.

George V. Johnson, secretary of the Industrial Relations Committee of the American Paper and Pulp Association has contributed good basic information and ideas on association safety activities that have appeared on this page in past issues.

Lea P. Warner, Jr., director of safety for the Warner Company, is active on the safety committees of the National Lime Association, National Crushed Stone Association and the National Sand and Gravel Association, all of which are made up of small firms.

Mr. LeGore as well as other committee members feel that this new blood will help the small business safety movement to be even more successful in the future.

Nature arms each man with some faculty which enables him to do easily some feat impossible to any other, and thus makes him necessary to society.—*Emerson*.



Last month members of the Linen Supply Association of America carried colorful truck posters in support of the national safety movement on more than 2500 livery vehicles. The poster, adapted from NSC material, is part of a year-around public relations program. This is the third year that the association has conducted such accident prevention.



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Unimpressive accomplishments and corporation politics had the key men shaking in their boots. But the top brass proved to be surprisingly human

WAR AND PEACE

By BILL ANDREWS

Feb. 2, 1956.

The struggle within Exsteel that began in December continued into the new year. It made a hash of my personal efforts to be an effective safety engineer through most of January.

Fortunately, production was slow, turnover of labor was low, and no catastrophes intervened, so, on the surface at least, my staff of assistants was able to carry on the routines with no conspicuous failures, even though I was not often present on the shop floor or even able to supervise my men as closely as I would have liked.

For, rightly or wrongly, I've devoted this month more concentratedly to corporation politics than I've ever before done for a comparable time.

I don't like politics. I don't like what it does to those involved, and to their relationships. Most of all I don't like what politics does to me.

Oh, I've played angles before. I've schemed and contrived and wheedled and overplayed and underplayed issues, for the sake of what seemed long-time gains that outweighed short-run retreats. But this high-level, choose-up-sides-and-connive-for-victory stuff of the last month tastes bad in my mouth.

It began, remember, when our president, under pressure to show quick and dramatic achievements to the financial powers-that-be, put the heat on Exsteel's department heads, including me, to prove that that in '55 our increased expenditures had paid off.

Since most of us were appointed at about mid-year, as part of a drastic shake-up of a sick company, several of us felt strongly that we could not be expected to prove a profit so quickly. I felt that way. So did the vice-president for manufacturing. So, most loudly, did the head of our product development department. A number of the staff department heads lined up behind the president, and tried to persuade us to stick our necks out in unfounded claims for past performance, and for unrealistically optimistic guesses of the profit margin in our proposed budget items for the coming year.

The first week in January, we had our first meeting of the rebel party. Danert, the manufacturing v-p, Norden of product development, and I spent the evening in a booth at a Near-North-Side steak house, mapping strategy.

I didn't talk much. It was Norden who was most vocal, demanding a firm, last-ditch fight, the delivery of ultimatums, and, if

necessary, the submission of all our resignations in one dramatic gesture.

But it was Danert, naturally, who was the influential voice. By the very nature of his position (and also by the fact that he had the qualities that fitted him for the position), he was in effect the man leading the boys. His was certainly the Number Two job in the whole company, while Norden and I were obviously less influential than a dozen other men on Exsteel's payroll.

What Danert wanted, and what we agreed in the end to do, was for us to be quiet, calm, and stubborn. We were to go ahead and do just what Johnson, the president, asked of us, up to but not beyond the point at which we felt we could make honestly realistic estimates. We were to be courteous and restrained, but, if pressed, we were to make reasoned explanations of our position, both to Johnson and to other department heads who tried to talk us into his viewpoint.

"There are several of the department heads," Danert said, "who may come around to support our view, if we don't offend them or accuse them of dishonesty." Danert was most emphatic on one point: none of us were

—To page 147

NEW LIGHTWEIGHT MICROCELLULAR NEOPRENE-CORK SOLES

add long wear and comfort

to trim safety shoes

by



Courtesy:
Iron Age Division
H. Childs & Co., Inc.
Pittsburgh, Penna.

They're sturdy safety shoes—but a look would never tell you. There's no hint of the steel box toes under those pebble-grain leather uppers. No work shoe "look" in the lightweight, cellular neoprene-cork soles, storm welting or stitching of "Dacron." Yet, the entire shoe is built for rugged duty, just like those soles of resilient neoprene.

Oil, grease—even corrosive chemicals—have little deteriorating effect on durable neoprene soles. They hold their neat profile on hot factory flooring . . . resist severe scuffing and abrasion without chipping or cracking. And throughout their long service life they offer buoyant foot support—a flexible cushion for every step.

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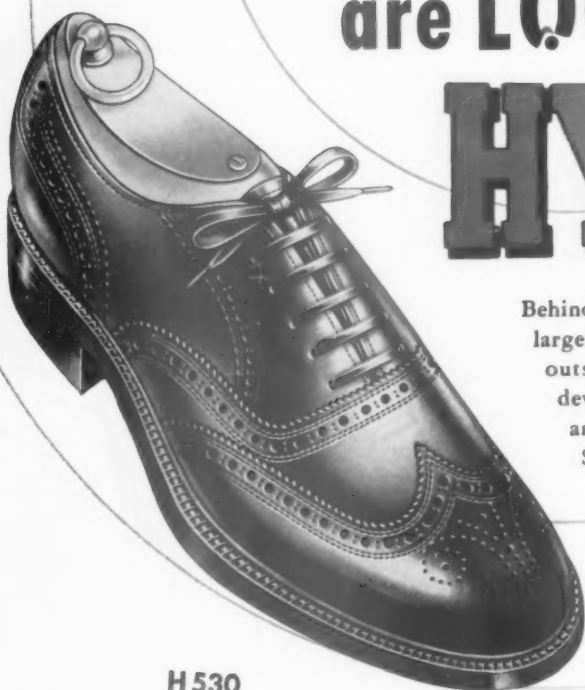
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National SAFETY NEWS

F E B R U A R Y 1 9 5 6

Meet the ASSE Journal

WITH this issue, NATIONAL SAFETY NEWS is pleased to present the first number of *The Journal of the American Society of Safety Engineers*. It will be found on pages 65 to 84.

The *Journal* will be published quarterly, with the February, May, August and November issues of the NEWS. ASSE members not affiliated with the National Safety Council, as well as members of the Council and subscribers to the NEWS, will receive the complete magazine.

The ASSE has been appropriately called "safety's professional fraternity." Through its chapters in the leading population centers of the U. S. A. and members at large in practically every country of the free world, the Society has exerted a far-reaching influence in raising the standards of occupational accident prevention work and the prestige of the safety engineer.

In large areas of the country ASSE chapters are important centers of safety influence. Through regular meetings the chapter members study accident problems and plan programs. Much mutual help is also extended through smaller informal conferences. Members are also prominent in the planning and programs of regional safety conferences and are well represented in the leadership of community safety organizations. They have also contributed invaluable knowledge and experience to research projects of National Safety Council, American Standards Association, trade associations, and other groups.

Each year the Society sponsors the important subject sessions at the National Safety Congress, making available a wealth of technical and program material to their audiences as well as to additional thousands of persons through the printed *Transactions* of the Congress and papers reprinted in NATIONAL SAFETY NEWS and other publications.

For some time the ASSE has felt the need for a printed publication to supplement its News Letter and present more technical material to members. The *Journal* is being published to meet that need. Although listed as a special feature section, as required by postal regulations, its policies and editorial content are directed by the ASSE.

In addition to the obvious economies of printing and mailing, we believe that this arrangement will strengthen both magazines and bring to readers new sources of help and information.

The Men Who Will Follow Us

What shall we teach the safety engineer of tomorrow?

By WILLIAM D. RENNER

THE SAFETY PROFESSION can look back on more than 40 years of hard-gained experience in accident prevention work and count the benefits in impressive terms. It is more important, however, that we look to the future where the best safety work is yet to be done.

We cannot predict all the problems which will face the accident prevention expert of 1980, but we have a pretty good idea of what some of them will be. We must make our experience available as a guide for tomorrow's men, just as we today are using the knowledge passed along by those who pioneered the movement in 1912.

The accident prevention field is constantly changing. When one type of hazard, such as machine guarding is brought under fairly good control, others, such as radiation and new chemicals, arise. To meet these changing situations we must have trained men. In New Jersey this has been recognized by the State Labor Department which has requested legislation pertaining to the registration of qualified safety personnel for New Jersey industry.

Tomorrow's problems may be complex but they can be met through the practical application of safety principles. The year 1980 is just around the corner. There is no time to sit and dream. We've

made a start and we must keep rolling to help the new man stay ahead of his accident problems.

What shall we teach?

Fundamentals. Basic knowledge is the foundation upon which the finished structure is built through practical experience. The safety man's education should include the following:

1. Basic principles of engineering sciences.
2. A concept of the science of industrial health.
3. Accident costs and how to estimate their true value.
4. Safety philosophy and psychology.
5. How to teach safety to others.
6. The dignity and stature of the safety profession.
7. How to get along with people.

Now for a brief discussion of these points:

1. Engineering Principles

The safety of any facility or piece of equipment has its roots on the engineer's drafting board. When safety features are incorporated in the original design, a serious obstacle to accident prevention has been removed. To assist in such matters the safety engineer must be a jack of all trades. His knowledge of principles must include:

Electrical. Why's, wherefore's, and methods of grounding. Basic phenomena of voltage, current, circuit wiring, transforming and distribution of electricity, and precautions to be taken. Information is readily available from handbooks and codes.

Chemical. Corrosive, toxic and flammable properties of the more common chemicals and how to guard against them. Once again, fundamental knowledge of chemistry, plus recourse to handbooks, National Safety Council Data Sheets, trade publications, and so on, will provide information for practical application in the field.

Mechanical. A knowledge of machinery guarding principles is indispensable. Also included in this field is ventilation, which will always be an industrial problem. The steady advance of automation brings new problems of control.

Civil. An idea of construction safety features, such as fire-resistive properties of materials, floor loads, stresses, adequate access, entry and exit facilities is important for intelligent scanning of blueprints. The safety man must learn to read plans and find the answers to his questions in codes and in publications of the National Fire Protection Association, American Standards Association, National Safety Council, State Labor Department, Manufacturing Chemists Association, and other organizations.

Industrial Engineering. Movement of materials through all phases of processing creates many safety problems. The safety engineer will do well to maintain close liaison with the industrial engineering people who are constantly devising more efficient and usually safer ways of moving materials.

Radiation. Finally, there is the

WILLIAM D. RENNER is Safety Supervisor, Schering Corp., Bloomfield, N. J. This article has been adapted from a paper presented at the session "Safety Training Down the Line," 43rd National Safety Congress, October 19, 1955.

work of the physicist, with all the problems of radiation. How extensive this will be in industry of the future is difficult to estimate. Control of radiation is prescribed. Safety engineers in many industries must master the prescription and apply it daily. There is a growing file of literature on the subject and numerous public agencies are equipped to give answers.

Such wide knowledge is not gained quickly or easily. By teaching the young safety man where to find the answer, we will do much to further his education and equip him for the never-ending fight against accidents.

The young safety engineer may be equipped with a degree in any of these science engineering fields or in arts or business administration, but he will soon discover a need for basic knowledge in all the science fields.

2. Industrial Health

This field is a profession in itself, but it is closely allied with the industrial safety effort. In many instances the safety engineer is called upon to deal with industrial health problems from a preventive standpoint. New sciences make this aspect of accident prevention extremely important. Knowledge should include forms and types of air contaminants, dermatitis causes and preventive measures, effects of industrial poisons on the human system, and physiological and mechanical controls.

3. Safety Philosophy

In the matter of philosophy and psychology we must teach the concept of safe individuals, rather than merely safe workers. We must point out that human actions are dictated from the mind and, therefore, the mind must be directed along safe channels in its thinking.

Through elementary psychology, involving the use of accident experience, the play upon the various basic drives we can exercise a safety influence on a person's mind. Here, too, the use of promotional efforts, advertising techniques and continuous propaganda can get an individual to

formulate his own safety psychology.

A sound safety philosophy recognizes the fact that we will always have accidents but we must also direct our efforts constantly toward the irreducible minimum of such occurrences and the greatest possible control of their consequences.

4. Accident Costs

These costs must not be interpreted only in monetary terms and in chargeable accident statistics and in the language of direct and indirect costs. They must also be understood in terms of their effect on productive capacity, on the individual, and on the society of which he is part.

How to use accident costs is important. When shown in their true light, they are a powerful argument for the whole safety movement. Knowing the right way to display these costs and make them

into an effective tool will help the safety man in his ceaseless battle to apply preventive controls.

5. Education and Training

The safety engineer must learn to teach. Recognition of the part played in accidents by the human factor has been ours for many years. Here, perhaps, is the biggest part of the job.

Industrial safety training is an art. It uses tried and successful teaching techniques and the most ingenious of visual aids. It calls for lively imagination and much repetitive effort. The safety engineer must realize that this educational work is like an inoculation—one that is not permanent because we are dealing with the minds of people which are constantly changing.

A major part of the educational program is directed at supervisors. They must be well grounded in

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Life's Hopes Dashed

Do you have to be the victim to learn that this safety stuff isn't a lot of bunk, and it can wreck you and yours in the bat of an eyelash?

Take Heathcliffe, for example. His folks protected him all his life, beat their brains out getting him through college, lined up a wonderful future for him—and he wrapped it all around a culvert at 90 miles per hour.

Or take Otto. Spent 15 years getting to be one of the best men in his trade, was set to cash in on all this effort—and he knocks it all off by not making sure the ladder feet were secure when he put up the storm windows.

Or Jerry. One of the handiest guys with his hands you'd ever expect to see, he could make anything—till he cut off a couple of fingers on the unguarded saw in his home workshop.

Or Winfield. Had two of the cutest little girls this side of heaven—till he ran through the barricade on that road construction job.

Or Bruce. Huskiest and healthiest guy in the whole crew—till he didn't pay attention to the warning labels on those solvents he was using and got enough strong whiffs to curdle his kidneys.

Or Sammy. Had the sharpest little guy in the pre-kindergarten set—till he got hold of those household chemicals his Mommy forgot to secure from prying little hands.

Or Waldo. Was a joy, and the life of every party—till that "one for the road" turned out to be "one for the ditch."

All these people—pure red-blooded American type citizens—the victims of "standard operating procedures" of thousands everyday. From just doing what comes naturally to most of us.

Will you dissipate your lifetime accomplishments by one act, or in one moment of thoughtlessness?

ROBERT D. GIDEL



Remote control and precision in handling radioactive materials is aided by three-dimensional television developed by the Remote Control Engineering Division of Argonne National Laboratory through industrial cooperation of Allen B. Du Mont Laboratories.

Learning to Live With the Atom

Radioactive materials are going to play a big part in our future. Like fire, explosives, poisons and high voltages they can work for us safely

By BERNARD MANOWITZ

ORDINARILY, a new industry is developed to meet an existing need. The reverse was true

BERNARD MANOWITZ is Project Engineer, Fission Products Utilization Project, Brookhaven National Laboratory, Upton, Long Island, N.Y. This article was adapted from a paper delivered at the 43rd National Safety Congress, October 1955.

with atomic energy, however. A new mode of power—the fissioning atom—was born and now uses for this power are being sought.

Great efforts are being made to harness the atom for the production of conventional electric power. Less attention has been paid to the radiation associated

with the fission process. However, it is this very radiation that may pay off in new technology, new products, and new benefits to mankind.

Nuclear radiation is an insidious kind of power. You cannot see it, hear it, smell it, touch it, or feel it. But every time an atom of uranium is split, copious quan-

tities of radiation are emitted, and their effects can be felt in many ways.

Radiation can kill men, but it can also kill insects and bacteria. It can penetrate steel, initiate chemical reactions, and change the physical properties of plastics and other materials. It can cause fluorescence and ionize gases and produce new strains of disease-resistant wheat and corn.

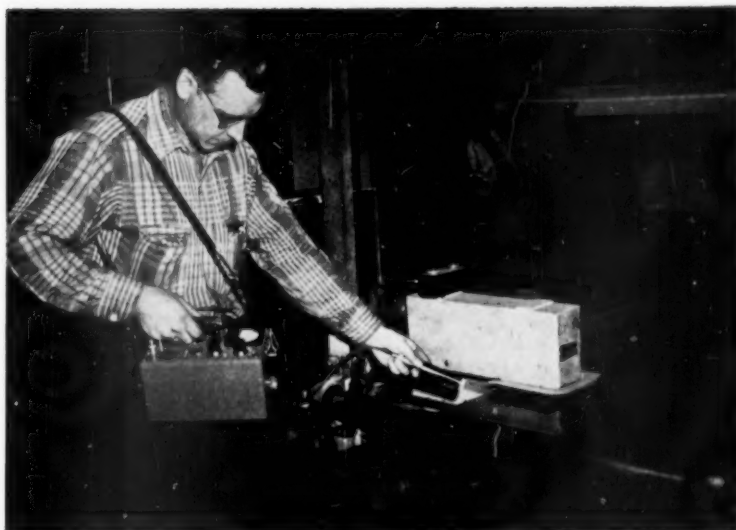
With these many possibilities radiation may yet find its place in the industrial family. "But," asks the practical-minded industrialist, "just how much of this radiation is available? How much will it cost? How can we handle it? What will it do that I can't do with more conventional methods?"

The potential availability of radiation power is closely linked with the future potential of atomic power. The principle on which atomic power is based is that every time an atom of fissionable material explodes it releases approximately 200 million electron volts of energy. When the 200 million electron volts of energy are converted to their heat equivalent, the argument is established that fissionable material (1 pound U — 2.10⁹ pounds coal) is a highly concentrated fuel.

However, when the fission process occurs, not all of the 200 million electron volts is immediately converted to heat. More than five per cent of the energy of fission at equilibrium is dissipated in the form of penetrating beta and gamma rays. Even more than five per cent of the power of fission may be used for ionization purposes, but this figure is a fair one, I believe, for our first crude estimate of the availability of radiation power.

Thus a good deal of radiation power is being generated today in the Atomic Energy Commission's nuclear reactors, but it is all being wasted by being absorbed in the huge concrete shields that surround present-day reactors. Nuclear reactors of the future, however, can easily be designed to optimize the extraction of radiation power.

What then is the future for nuclear reactors? A great many peo-



Beta gauges used to measure thickness of steel strip at Armco Steel. Use of these gauges calls for radiation checks with a Geiger counter.

ple, including myself, are convinced that we are now entering the Atomic Age. America's power needs are expanding. Her supplies of fossil finds are being depleted. The American government for its own defense and for the ultimate conservation of its resources has poured billions of dollars into the development of atomic energy.

American industry, sensing the birth of a great new industry, has made rapid strides in the advance of a new technology.

This country now has nearly 100,000 megawatts of conventional electrical generating capability—about 40 per cent of the electrical power of the world. Do

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Badge worn by employee at Oak Ridge National Laboratory contains X-ray film which records radiation to which wearer has been exposed.

Frequent inspection is the price of safety where hoisting chains are used. Chain is unsafe when elongated 3 per cent more than standard length or links are worn to 20 per cent below standard thickness. Hooks should be replaced when opened 35 per cent more than standard opening.

Like the human body, it
may look OK but it
takes an internal inspection
to make sure



How Safe is That Chain Hoist?

By E. S. MOORHEAD

BEFORE sitting down to write this article I made a canvass of local shipyards, looking into the problems of the hand-operated chain hoist.

I came away convinced that the chain fall is not a mechanism; it is a miracle.

E. S. MOORHEAD is District Manager, Hoisting Equipment, The Yale & Towne Manufacturing Company, Philadelphia. This article has been adapted from a paper presented at the Spring Meeting of the Marine Section, National Safety Council, in conjunction with the Greater New York Safety Council, April 1955.

The hand hoist work in a shipyard is probably the roughest, toughest use a hoist can get. To use and maintain them for longest life and maximum safety, tough controls are needed.

What I am about to recommend may seem unrealistic—that I expect too much for this type of work. Nevertheless, I believe that the establishment of certain controls will result in fewer hoist failures and longer life for equipment.

The human body, any doctor will tell you, is a most deceptive

piece of equipment. A man may appear calm, cool, and collected, but intensive examination shows that this poor fellow not only has ulcers, but his ulcers have ulcers. To discover this, the doctor undoubtedly found clues in the man's behavior, his blood pressure, etc. But a real internal examination was necessary to be sure of the patient's trouble. To a layman, he looked fine.

The chain fall is somewhat in this category, but I would say it is more "honest" than the human body. The majority of its ailments

can be spotted by anybody. For instance:

- If the brake is worn, it starts to slip gradually.
- If the hoist is a "wetbrake type" and lowers hard, it needs lubrication.
- If the hook is open, it has been overloaded or improperly loaded.
- If the chain is stretched, it doesn't seat properly in the load sheave.

All of these things give you an obvious visual warning.

But, like the man with ulcers, the internal parts may have been damaged or badly worn. Like the doctor, unless you *look inside*, you will never know until the hoist fails.

The obvious answer is routine internal inspection. However, this is only part of the answer. Again, like the doctor, we have to find a way to prevent this trouble in the future, to give our patient, the chain fall, a long and useful life.

Let us take our "controls" one at a time and our first consideration will be "inspection."

Inspection

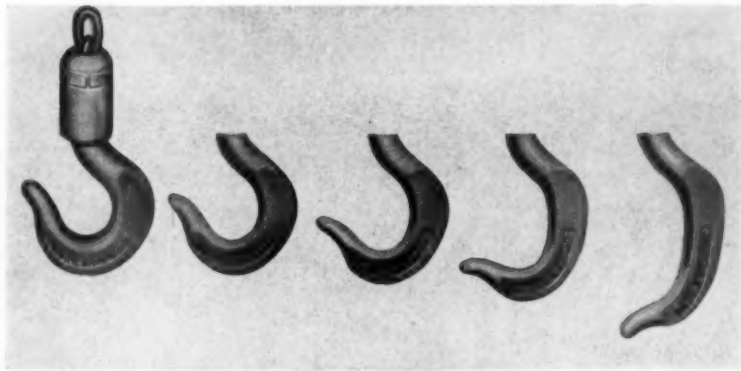
On-the-job inspection is a necessity. Many unsafe conditions can develop on the job. We're whistling in the dark if we depend on the hoist to stay in safe condition after it leaves the storage area.

To assist in spot checking, Yale has developed a check gauge to compare chain stretch, chain wear, and hook opening to the maximum safe limits. The gauge has two points, set apart at the maximum safe length for a given number of links. A small slot in the end of the tool is the minimum safe link size, and is used for measuring the wear at the bearing points of the chain. The over-all width of the end of the gauge is the maximum safe hook opening.

These dimensions are based on the following rules of thumb:

1. Chain 3 per cent or more longer than its standard length is unsafe.
2. Links worn to 20 per cent below standard thickness are unsafe.
3. Hooks opened 35 per cent more than standard opening are unsafe.

While we set the above figures as rules, our common sense tells



Stretched hooks should never be reshaped. Cracks will usually be found on the inner surface which has been under tension while the outer surface has been compressed. Reheating does not eliminate these weakening defects and takes away the effect of the original heat treatment.

us that whenever we spot stretched chain, worn links, or opened hooks, the safest thing to do is replace them. Why gamble with lives and equipment?

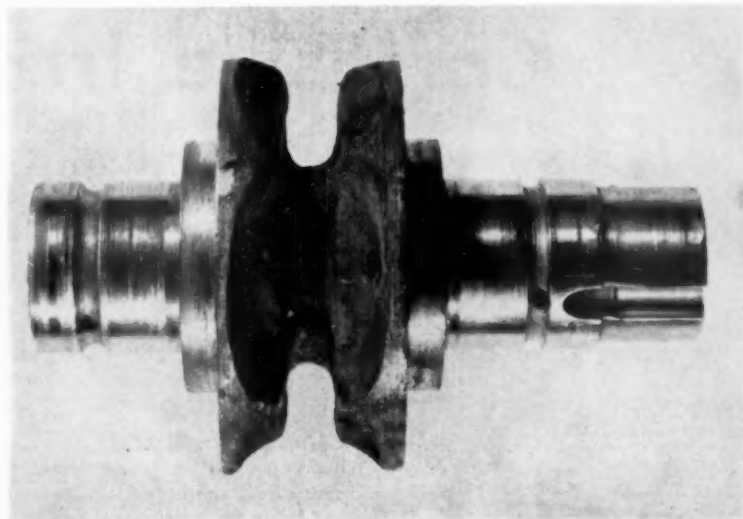
This tool, as designed, is good for only two sizes of hoists of a particular make. Each hoist manufacturer may use a different pitch chain or different type hook, so you will need a set of gauges for each make hoist.

It is advisable to have, in addition to a safety inspector covering the hoists throughout the yard, someone in each working crew, usually the leader, keeping an eye on the hoists for defects.

On-the-job Inspection should check the following:

1. Check chain for wear, stretch, or damage to links.
2. Check hooks for opening.
3. See that both top and bottom hooks are carrying the load at the hook center and not on the hook tip.
4. Check handwheel action. The handwheel has a back movement (or play) of one to one and a half pockets before the handwheel strikes the check washer lug. If it has to turn three pockets or more, some of the brake parts are worn and need replacing.
5. Check action of hoist. If it lowers hard it usually means lack of lubrication in brake. If you have excessive pull in both directions it can mean lubrication, or it may be a bent driving pinion.

Shop Inspection. All hoists returned to the rigging loft at the
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If chain on a hoist has been stretched, look for worn sheave pockets. If pocket shoulders are worn down replace sheave.



Protecting People and Plant Against

Corrosive Irritants

By JACK T. GARRETT

PRI-MARY irritants are materials which, from the standpoint of chemistry, would be considered corrosive. These materials act by injuring the skin, eyes, and, if inhaled, the surface tissues of the respiratory tract. This may lead to inflammation of the air

passages and possibly the lungs themselves.

The effects of the various irritants vary somewhat due to differences in solubility, physical state (solid, liquid, gas), and portion of the body exposed.

A **primary irritant** is a material that causes little or no systemic toxic effect in the concentrations that bring on injury or death due to its local action. This means that the corrosive action is the

primary hazard. An example would be hydrochloric acid.

A **secondary irritant** is a substance that, while being an irritant to exposed tissue surface, exhibits a greater hazard from systemic effects. An example is hydrogen sulfide.

Irritants can be classified rather loosely by physical form, such as liquid, solid, or gas.

Liquid Irritants

Primary irritants may act on

JACK T. GARRETT is Industrial Hygienist, Monsanto Chemical Company, St. Louis, Mo. This article has been adapted from a paper before the 43rd National Safety Congress.

the skin rapidly or slowly depending on their concentration and length of contact. The more concentrated the irritant and the longer the contact, the more rapid and intense is the resulting inflammatory process.

These irritants act directly on the skin, either by chemically reacting with it, by dissolving or abstracting from it some of its essential components, by denaturing the proteins of the skin, or by disturbing the membrane equilibrium or osmotic pressure of the skin cells.

These processes pertain to all irritants, regardless of their physical form. However, liquid irritants are by nature in the best physical form to cause immediate damage and are the most hazardous as far as external injury is concerned. They cause the greatest number of chemical burns and chemical eye accidents in industry today.

Examples of Liquid Irritants

1. MINERAL ACIDS

- Nitric acid
- Sulphuric acid
- Hydrochloric acid
- Hydrofluoric acid
- Phosphoric acid

2. ORGANIC ACIDS

- Formic acid
- Acetic acid
- Chloroacetic acids
- Cresylic acid

3. ORGANIC SOLVENTS

- Petroleum solvents
- Coal tar solvents
- Chlorinated hydrocarbon solvents
- Most liquid esters and ketones
- Most of the alcohols
- Carbon bisulfide
- Turpentine and terpenes

These irritants are all liquids in their normal physical state. However, many cases of irritation occur from solutions of solid irritants, such as the caustics, the oxidizing and reducing salts, and many organic salts, such as organic acids, anhydrides, halogenated organics, and many others.

Most burns received from liquid irritants in our company have been caused by accident, such as ruptured lines or spills. These accidents are held to a minimum. Where they do occur, we have employees who are disabled in one form or another from the action of liquid irritants.

When an employee in the performance of his normal operating duties handles any liquid irritant, he is provided with protective equipment, such as rubber gloves, boots, and proper respiratory protection, if necessary, since many of the liquid irritants become gaseous irritants at elevated operating temperatures. We provide emergency equipment in areas where potential hazards from liquid irritants exist. These include air-supply respiratory equipment, protective clothing, and canister-type gas masks where applicable.

Because of the vast possibilities of contact with liquid irritants, we have found that the best program to eliminate this type of exposure within our operating plants is a

strong educational program carried out by our safety engineers after thorough indoctrination from the operating supervisors and foremen of the respective operating units. The fruits of this program are apparent from the very few cases encountered in plants that handle millions of pounds of liquid irritants each year.

Concerning first-aid procedures, we recommend immediate flushing of the affected skin or eyes with copious quantities of water. We recommend this procedure for at least 15 minutes for eye contact. Then the patient should be referred to a physician.

In many cases, use of neutraliz-
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Head-to-toe personal protective equipment is one of the major keys to accident prevention where corrosive materials are handled. Here, each worker wears a safety visor completely shielding his face. His body, legs, and feet are protected against burns by specially-treated aprons and boots. Chemical-repellent sleeves and gloves allow maximum dexterity. (Photo courtesy Mine Safety Appliances Company.)



Patching Up Some Industrial By-Products

By W. B. McCUNIFF, M.D.

Many a minor injury can be kept from developing into a major disability. That's where the medical department comes in

A FASCINATING THOUGHT occurs to me occasionally; are we aware that our professions of safety and medicine, along with that of the ministry, are plunging headlong into self-extermination? If there were no sin there would be no more preachers. Without accidents, there would be no need for safety men. And if there were no more accidents or disease, there would be no need for doctors.

But human nature being what it is—despite agitation, education, admonition and even irritation,

DR. W. B. McCUNIFF is a practicing physician in Kansas City, Mo. This article has been condensed from a talk delivered at the Central States Safety Congress, Kansas City, April 1, 1955.

pleas, signs, gadgets and gimmicks—accidents still happen. Hard hats, hard shoes, and hard glasses are still worn on soft bodies. And these soft bodies do break, burn, tear and cut.

If we, then, are engaged at least part time in salvage operations on these bodies, we must try to minimize the disability, immediate and final.

I have no magic formula for minimizing disability from injury. I can only report a few observations we have made in industrial medicine. Some of these are "reverse" operations—how to convert minor injuries into major injuries.

The best and most obvious place to prevent disability, of course, is to prevent the injury.

That's not news to you, it's your business. But we try to prevent them in our business, too.

For instance, if I were applying for a job, I'd do everything possible to put up a good front and make a favorable impression. I'm no bluenose, but I wouldn't show up with liquor on my breath. You'd be amazed how many do. If I applied after the proverbial "two beers" isn't it reasonable to expect that I'd go to work in the same condition?

There are some spectacular combinations possible—two shots of bourbon and a punch press, for example.

As to common correctable physical defects, hernias, weak abdominal scars and weak inguinal rings are a dime a dozen but the cost

of paying for one runs a little higher. And a doctor who passes such a man for hard labor is doing everybody dirt. To be less cold-blooded, we're doing the man dirt, even if we pay to have his rupture fixed later. People do die with operations and if we've deliberately placed this man in jeopardy so he blows out his hernia and he dies having it repaired, who killed him? Or if he doesn't (and most don't) has this employee been a good investment for the company?

The same is true of men with back disabilities, with visual and other defects. We're hiring a man carrying a stick of dynamite and the fuse is already lit. The only question is, "How long is the fuse?"

I am not implying that all men with handicaps are poor risks. Properly placed, they can be very good risks, but they can't be turned loose on unrestricted hard labor.

Once a man is hired, the minimizing of his disability falls on the medical and safety departments. There's no need to go into protective devices—you believe in them or you wouldn't be on the job, although in some circles they are still rare.

Well, "Hardly Ever!"

I remember mentioning to an engineer one afternoon that his pipeline workers didn't wear safety shoes. He assured me that they "hardly ever" dropped anything on their feet.

Less than an hour later, one of his men was brought in, wearing on his battered foot the remnants of a crepe-soled loafer shoe. A tamper had gotten loose, wedged his foot against a rock and beaten his foot to a pulp. After 18 months of treatment he had a foot he could walk on—but not work on.

Coming down to actual injuries, the vast majority of them are not amputations, not fatalities, not even gruesome; they are minor. We don't need safety programs so much to prevent the relatively rare major accidents as to prevent the nickel and dime accidents and to minimize the disability resulting from them.

It's a little difficult to define a

WHEN TREATING INDUSTRY'S CASUALTIES

- Call injuries as you see them
 - Admit that injuries hurt
 - Don't act horrified
 - It takes longer to get over an injury than to have one
 - Consider the injured man's production in the same light as you would consider it if YOU had been injured
-

minor accident. A good definition is that a minor accident is one that happens to someone else. To the man who has it, any accident is a major accident.

Two items are absolutely essential in the care of an injured man. One, I learned from my grandfather: "The man hasn't been born yet who's smart enough to be a consistent liar." So, lest you get caught up, call 'em as you see 'em. Report the same facts to everybody; management, labor, and the patient deserve the same story. If you don't, you've sided with somebody, and you're going to get crossed up in your stories.

The other I learned long ago from a doctor who stuck me with a needle, after saying "this won't hurt." Injuries do hurt and all of the "this won't hurt" conversation is only going to make the injured employee feel about us like I still do about that doctor. So, tell your injured man the truth; acknowledge that his injuries hurt.

And here's one quick lesson in how to make a major injury out of a minor one—be horrified! I know of one otherwise capable nurse who has mastered that art. An employee walks into the dispensary with a handkerchief wrapped around a bleeding hand. With no element of panic, she removes the handkerchief, surveys his small but bloody laceration, arches an eyebrow, and goes "P-h-e-w!"

Psychological Wounds

Regardless of what happens after that, this man has a major injury. He thought so when he got hurt (it was his injury). Now, without a word, the medical department has confirmed his worst suspicions. His wound will heal beautifully after washing with

soap and water and applying a compress, but psychologically this man is seriously hurt; he has had a major accident.

The same situation prevails in many other cases. An employee receives a bruise or a knot on the head and is just about ready to return to work when some helpful soul arrives on the scene and assures him he's lucky he wasn't killed—falling that far or being hit by that many pounds.

The man is probably aware of that already, but after a few editorial comments such as these he breaks out in a cold sweat, gets weak in the knees, starts to hurt all over and goes home to be comforted by a solicitous family. Here he remains just long enough to get strong in the knees and ponder the gory details of his injury. Then to a lawyer and the fight's on.

Silence Is Golden

If there is any rule of thumb for dealing with injured people, it's simple and uncouth: *Button your lip!* We have no intention of sounding superior saying that you can't classify major and minor injuries, but, in all honesty, we have enough trouble doing just that ourselves. So, if for no other reason, don't louse us up.

Injuries in industry are fairly predictable. Most common are injuries to fingers and hands, followed by eye injuries, then foot injuries and those involving the rest of the body, especially the back.

Most hand injuries fall into one of three categories, or a combination thereof: Lacerations, fractures, or amputations.

Whenever there is a break in

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C. A. Knuepfer (left); his son Jack, director of the company (right), and William Lawrence, maintenance man, examine a basket frame developed for use in the tempering furnace.

Below: Maintenance Man Lawrence makes a minor repair on a centrifugal separator similar to one which, 30 years ago, figured in an accident that forcefully called the company's attention to the need for a safety program.



The President's Other Hat

In this 90-man plant, the chief is safety director, too. The set-up's informal, but it's getting results

By WILLIAM R. VATH

THE responsibility for safety must depend on one individual. If he doesn't take care of it, it doesn't get done."

That's how the individual in charge of safety at General Engineering Works, a Chicago screw machine products company, sums up an effective safety program for small firms. He is C. A. Knuepfer, president and general manager of a company whose 90 employees have had only one disabling injury in the last eight years.

He has proved that such a remarkable safety record can be

achieved in a small plant without a formal safety organization.

Safety, says Mr. Knuepfer, is like any other part of good management and he lists these rules for its success:

1. Lay out a plan.
2. Put it into operation.
3. See that it is carried out.

His plan is simplicity itself. He is personally in charge of safety. A maintenance man carries out his decisions. The rest is up to the 90 employees.

In a plant where everyone is on a first-name basis, the president

walks through the machine shop at least once a day. "You'll see him going through with a pencil and piece of paper," says one of his foremen. "If he sees something that's not quite right, he makes a note and you can bet it'll be fixed fast."

Ask Mr. Knuepfer why he believes in safety and you'll get this answer: "I can't tell you what our safety program costs in dollars, but it's not very much. The biggest expenditure is the time it costs me and my maintenance man. But the returns far outweigh the expense."

"Safety goes hand-in-hand with making a profit. Not only does accident and fire prevention eliminate lost production time, but it gives us lower fire and compensation insurance rates. More important, however, especially in a company like this where we feel we are one big family, is the humane element."

His company's figures on compensation insurance back up this statement; for 1953-54 his credit was 25 per cent; for 1954-55, it was 29 per cent.

Maintaining Interest. The General Engineering Works has no safety committee, nor does it hold safety meetings as such. Twice a year, however, the president speaks at a meeting of all employees and safety is brought forth at these times. The company uses National Safety Council posters spotted at several places throughout the plant, but most numerous on bulletin boards near the time clock where workers are most likely to see them. Posters are changed regularly.

Pamphlets, key chains, playing cards, and other incentives are distributed about every three months. All carry a safety message. Themes of some are off-the-job safety, e.g. driving, vacation, home hazards. Others are chosen to fit poor practices noted in the plant.

There is no formalized suggestion system, but Mr. Knuepfer is often stopped during his walks through the shop by an employee with an idea.

Employees take pride in the fact that the company has won NSC's Safety Contest in the Light Fabricating Division of the Metals Section seven times in the last eight years. In 1953 and 1954 they were awarded certificates of commendation by the Council. Speaking of these awards, one foreman said, "Maybe the men don't go around bragging about them, but they'll say: 'Well, I see we got another one.' So I know they notice the awards and are proud of them."

A Matter of Habit

Interest in safety and the actual prevention of accidents is largely a matter of habit at General Engineering, says Mr. Knuepfer. "If you can develop in your employees certain habits safety becomes a fixed routine and many accidents are automatically prevented," he explains.

Veteran employee Edgar Bingham, tool department foreman, agrees. He says, "Our accident record is due to two things: the safety habit of all employees and constant vigilance on the part of management."

Attitudes toward safety vary with employees' ages, according to the company's experience. The most careful workers are those of middle-age. Younger workers, though more easily trained in safety, are most likely to be guilty of unsafe practices. The oldest men grew up in an era where a certain percentage of injuries was

accepted as inevitable and when accident prevention was seldom mentioned. These oldtimers often find it difficult to learn new and safer methods.

Fire Prevention. The plant's fire protection system includes portable extinguishers using CO₂, carbon tetrachloride, dry chemicals, foam, and soda-acid. In addition to a sprinkler system, a hand-pulled hose cart with 250 feet of one-inch hose is provided for connection to any one of five hydrants. Extinguishers are checked according to a regular schedule.

A fire brigade of three foremen and four other employees is trained in fire-fighting procedure. They are re-instructed in the use of extinguishers regularly.

The company has had only one fire in its 33-year history. A few years ago, brass turnings, piled up in burlap bags awaiting shipment, caught fire from spontaneous combustion. Although the loss was small, this experience was enough to cause the management to discontinue the use of any wood.

An all-steel bin was built and the turnings were stored in bulk instead of bags. As a further precaution aluminum waste, though not developed in as large a volume as brass, is shipped out frequently.

This is typical of the way in which General Engineering attempts to correct situations as they arise and the way in which

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Typical of the housekeeping conditions at General Engineering Works are these shelves where metal stock is stored. Floors are kept clean and aisles clear.



When some new automatic screw machines arrived with the inside of the guards painted a bright yellow for better visibility, the company adopted the idea for all such guards.



SAMMY SAFETY'S NOTEBOOK

By Arthur S. Kelly

Senior Consulting Engineer, Industrial Department, NSC

We promised the lowdown on awards for contributions to this department. Here it is. The monthly award will be your choice of a Parker "51" standard fountain pen or a beautiful lighter set in Italian black and gold marble.

The semi-annual award for the best idea submitted during the preceding six months will be your choice of the handsome desk clock or one of the two luxury billfolds, either alligator or ostrich hide. The six-months award will be in addition to any monthly award presented.

Every company has at least one idea, gimmick, or gadget which will qualify for *Sammy Safety's Notebook*. Those we cannot use in the *NEWS* because of space limitations will be converted to Detail Sheets or illustrations in some other Council publication, with full credit to the source.

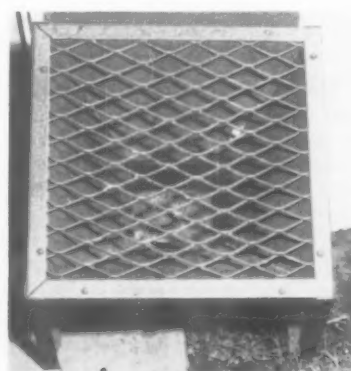
In this issue we are still borrowing or using material already on hand. *Sammy Safety's Notebook* will not appear in the March issue so you will have an extra month to submit your material.

Glossy 8 x 10 photos are preferred where possible, but clear snapshots often are satisfactory. Line drawings and sketches should be cleanly drawn to permit reduction. Large rolled photostats or blueprints seldom make satisfactory cuts in the space available.



Butts a Nuisance?

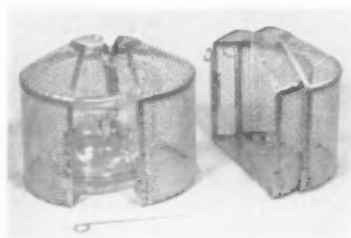
Either of the two ideas shown above will take care of the nuisance of cigarette and cigar stubs



littering the entrance to a building in which no smoking is allowed. These ideas were developed at the Robbins Air Force Base, Ga.

Dessicator Guard

All glassware subjected to vacuum presents an obvious hazard. The dessicator guard shown at right, made of heavy hardware cloth, allows the guard to be set in place after the apparatus has been assembled. The guard sections can be nested together for



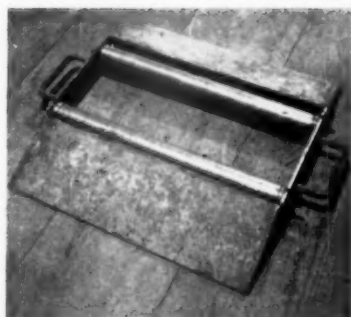
compact storage. (Columbia-Southern Chemical Corporation.)





Handling Cable

This reel-roller platform eliminates the need for lifting and placing reels of heavy cable on a



rack. In addition, very little effort is required to unreel the cable. In the second picture, a close-up of the platform shows the details of its construction. The frame is metal plate and the ball bearing rollers are the kind used on standard roller conveyors. The reels of cable can be rolled up the slight incline with little effort and the reel seats itself on the rollers.

This idea was developed by the Lehigh Portland Cement Company, Iola, Kan.

Jack-hammer Jig

This jig for use with a jack-hammer is both functional and protective. The operator places



the ball of each foot on the straps welded to the jig with the cutting bit fitting closely inside the jig. The jig cannot be removed from the drill shank without removing the cutting bit. Hazards from flying particles as well as exposure to foot and ankle injuries are eliminated. (Corps of Engineers, Missouri River Division.)

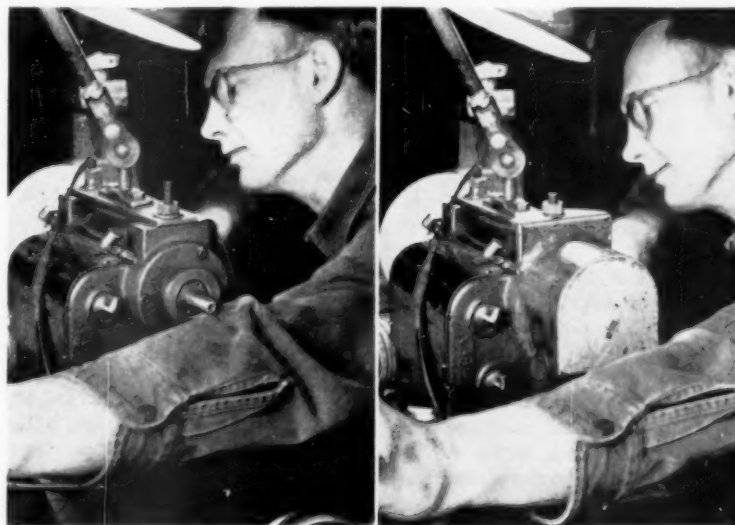
Airline Respirator

This portable airline respirator is ingenious. It consists of a com-



mercial airline respirator mounted on a sheet metal panel which is bolted to a standard flight line fire extinguisher cart. The mobility of this unit makes it easy to provide protection for tank cleaning and similar operations.

This idea was developed at the Piasecki Helicopter Corporation.



Spindle Guard

Simple? Sure—but this spindle guard shown in the picture on the right eliminates the possibility of injury. It was developed by the National Supply Company, Torrance, Calif.

ACCIDENT POST-MORTEM

What caused that accident? What would have prevented it?

A review of cases by Franklin G. Pater

Senior Engineer, Industrial Department, NSC

This month we will discuss some materials-handling accidents involving both manual and mechanized methods.

We need your help. Our file of accident cases is limited. You can help us by sending details of accidents that have occurred in your organization. Descriptions should include:

1. Complete description of accident.
2. All circumstances—mechanical and environmental—surrounding the accident.
3. Photos and/or drawings, if available.
4. Findings of the investigation.
5. Conclusions.
6. Action taken.

Strain Moving Material Up Incline

The employee was moving rolls of material into storage with the aid of a two-wheeled hand truck. He started up an incline to the warehouse, pulling the truck and a roll, weighing approximately 600 pounds. Halfway up the incline, he felt a sharp pain in the lumbar region of his body which almost caused him to pass out. The employee reported that the footing was good and he did not slip.

It was brought out later that the employee had had several pains in his back prior to this time. These pains, which he assumed were muscular aches, began about the time he started on this job. His back had bothered him quite a bit over the week-end.

Comment: The direct cause was trying to pull a 600-pound roll up the incline without assistance. Of course, in a case like



this, the first consideration should be the use of mechanized equipment. In the event that mechanized equipment would not be advisable then management should supply the employee with help to move a 600-pound load.

The question of the amount of force that can safely be exerted by an individual, in a horizontal plane is highly controversial. In fact, we have found only one source of information that will quote any figures. This source suggests a safe horizontal push of 32 pounds, walking at 90 steps a minute, at a height of 30 inches above the floor. These figures are by no means accepted throughout industry.

Caught Under Suspended Load

Large rolls of paper were being transferred from the paper machine to the storage pit prior to a finishing operation. To handle the rolls an overhead crane was used with a steel beam or yoke to hook onto each end of the reel shaft.

The employee was working in the pit unhooking the beam, or yoke, as the paper rolls were placed by the crane operator. In lowering the beam to allow slack for unhooking, the beam in this case rested on top of the paper roll so that there was slack also between the eye of the beam and the crane hook. When the beam was raised, apparently the eye was on the point of the hook and not fully inside the hook.

When the crane was moved, the eye of the beam became disengaged from the hook and the beam fell. The employee, in attempting to get out from under



the falling beam, jumped from an insecure footing on top of the paper roll, and was fatally injured.

Comment: Of course, the employee should not have been under the yoke or beam while it was being moved. From an engineering point of view, however, the hook on the crane should have been equipped with a safety latch, or catch. This would have prevented the eye of the yoke, or beam, from coming out of the hook and falling as the crane was being moved.

Raining Rolls of Material

A tractor operator was stacking rolls of material weighing approximately 180 pounds and 19 in. wide and 34 in. in diameter. Rolls were being stacked nine high in the storage area. Using a tractor which did not have an overhead guard, the operator was attempting to place a stack of six rolls on top of three rolls on the floor level.

The tractor was designed to handle two rolls at the time. This would enable the equipment to hold the two rolls so that none of the rolls would extend beyond the top of the clamp when stacking or transporting the rolls of material.

When the operator raised the stack to position, the top two rolls from the stack which had extended above the mast fell backward, the rolls striking a glancing blow on his head, with the brunt of the fall on his back.

A fellow employee assisted the operator to the first-aid room where he was examined by the

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MAGNESIUM

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1. This data sheet discusses safe practices in the storage and working of magnesium and magnesium alloys. Primary production of magnesium and the manufacture of magnesium powder are not included.

2. The problems in storing magnesium are fire prevention and fire control. The principal hazard in working magnesium is fire caused by improper methods or by failure to take proper precautions when machining, grinding, casting, or heat treating.

3. Other hazards are those which exist in the working of any metal, including the danger of burns from metal in the molten state and of mechanical injuries in the working or handling of solid metal. The fumes incident to chemical treatment of the solid metal must be well vented and oxidation of the molten metal must be minimized.

Characteristics

4. Magnesium is a silvery white metal characterized by extreme lightness, having a specific gravity of 1.74 and an atomic weight of 24.32. The melting point is 1202 F. (650 C.), and the ignition temperature is generally considered to be very close to the melting point.

5. When the rate of heating is rapid, magnesium melts before it burns. At this point, in addition to the fire hazard, there is the problem of handling the molten metal. As with other metals,

This Data Sheet is one of a series published by the National Safety Council, reflecting experience from many sources. Not every acceptable safety procedure in the field is necessarily included. This Data Sheet should not be confused with American Standard Safety codes, federal laws, insurance requirements, state laws, rules and regulations, or municipal ordinances.

there is an explosion hazard if the molten metal is allowed to come into contact with moisture.

6. Alloys may have ignition temperatures considerably lower than the figure for pure magnesium. In these cases, it is necessary to consider the lowest melting point of the alloy, which may fall below 900 F. The alloy may ignite if it is held for some time at this lower temperature. It is desirable, therefore, to know the properties and characteristics of products being handled or stored. Such information is usually available from producers or distributors.

7. When heated in air to just above the melting point, pure magnesium ignites and burns with an intense white flame. The ease of ignition depends to a large extent upon the size and shape of the material, as well as the intensity of the source of ignition. In the form of ribbons, shavings, or chips with thin feather-like edges, or of grinding dust, a temperature of 950 F., a spark, or the flame of

a match may ignite the material under certain conditions.

8. Finely divided magnesium powder has been ignited at temperatures below 900 F. Heavier pieces, such as ingots and thick wall castings, are difficult to ignite because heat is conducted rapidly away from the source of ignition. The entire piece of metal must be raised to the ignition temperature before self-sustained burning can occur.

9. Since molten magnesium alloys will burn in air, they must be protected by a suitable flux or by a protective atmosphere. The fluxes used consist of chlorides and fluorides of alkali and alkaline earth metals. Sulfur dioxide, helium, or argon gases can be used to provide a protective atmosphere.

10. The pure metal has limited industrial use, but certain alloys, particularly those containing aluminum and zinc, combine high mechanical strength with lightness and, therefore, have many structural applications. Magnesium alloyed with small amounts of several other metals is available to industry in the usual fabricated forms, including ingot, sand castings, die castings, permanent mold castings, extruded shapes, forgings, plate, sheet, and strip. These commercial magnesium alloys, under various trade names, are the forms in which most industrial users come into contact with magnesium metal.

Storage

11. Pigs, ingots, or billets should be stored in buildings of non-combustible construction. The floors of these buildings and the supports used under the piles of material should also be noncombustible. Floors should be well drained to prevent accumulation of water in pools.

12. Magnesium ingot storage should be restricted to the ground floor level. There should be no basement or depression below the magnesium storage into which water and molten metal may flow or fall during a fire.

13. The quantity stored indoors in any one pile should be kept to a minimum, but in no event should exceed 500,000 pounds.

14. If magnesium must be stored in a combustible building or if it is exposed to other combustible material, automatic sprinklers are desirable, not to put out magnesium fires, but to protect the combustible material in the area. Automatic sprinklers do not discharge water at a rate sufficient to extinguish magnesium fires by cooling. They do, however, serve to prevent ignition of surrounding materials and thus localize the fire. Where automatic sprinkler protection is not provided, 24-hour watchman service or automatic fire alarm service should be maintained.

15. In both indoor and outdoor storage, aisle width should be not less than one-half the height of the piles; aisle width equal to the height of piles is recommended. Readily combustible material should not be stored within 10 feet of any pile of magnesium ingots. Accumulations of trash should not be permitted in the magnesium storage area. In outdoor storage, an open space equal to the height of piles plus 10 feet should be provided between the stored magnesium ingots and adjoining property lines where combustible materials or buildings are exposed.

16. In open or yard storage, magnesium ingots should be carefully piled on firm and approxi-

mately level areas to prevent the piles from tilting or toppling. Storage areas and yard pavements should be well drained, and no combustible flooring or supports should be used under the piles. The quantity stored in one pile should be kept to a minimum, but in no event should the amount exceed 1,000,000 pounds.

17. Castings should generally be stored in the same manner and with the same precautions as ingots. They should be stored in noncombustible containers, if possible. However, if combustible containers must be used (not recommended), piles of magnesium castings should be limited to 1,000 cubic feet and automatic sprinkler protection should be provided.

18. Magnesium castings in storage should be segregated from combustible material. A slow-burning fire in nearby combustible material may develop enough heat to ignite thin section magnesium.

19. *All magnesium castings placed in storage should be clean and free from chips or fine particles.*

20. The same general precautions indicated for storage of mag-



Figure 1. Clearly labeled metal container for collecting magnesium fines. (Photos courtesy of Aluminum Company of America.)

nesium castings should be taken in the storage of sheet, plate, and extruded shapes. Bins for the storage of extrusions should preferably be of noncombustible construction. Bins holding quantities greater than 2,000 cubic feet of rack space should be separated by aisles wide enough for fire protection or by vertical partitions of noncombustible construction.

Control and Disposal of Fine Scrap

21. Chips, turnings, and other fine magnesium scraps should be collected from the pans on the machines and from any other places where they accumulate as often as necessary to prevent the accumulation of any large amount, and always at the end of each day. Fine magnesium scrap should be collected in *clean, dry, covered, plainly-labeled metal containers* see (Figure 1) and removed at least daily to a special scrap storage room of fire-resistive construction or to a detached scrap storage building. Such rooms or buildings should have explosion vents equal in area to at least one square foot for each 15 cubic feet of room volume.

22. Fine magnesium should be kept well separated from other combustible materials. Fine magnesium scrap in quantities greater than 50 cubic feet (six 55-gallon steel drums) should be stored in areas separated from other occupancies by fire-resistive construction without window openings or by an open space of at least 50 feet. Quantities greater than 1,000 cubic feet should be stored in areas separated from other occupancies by a distance of not less than 100 feet.

23. If shavings, chips, and any other fine scrap are included with scrap to be remelted, special precautions must be taken to ensure that the mixture is thoroughly dry. Chips or fine material, wet with neutral mineral oil coolants only, can be dried by being spread in a layer about two inches thick where warm air can be passed over it.

24. Scrap to be disposed of should be burned in thin layers

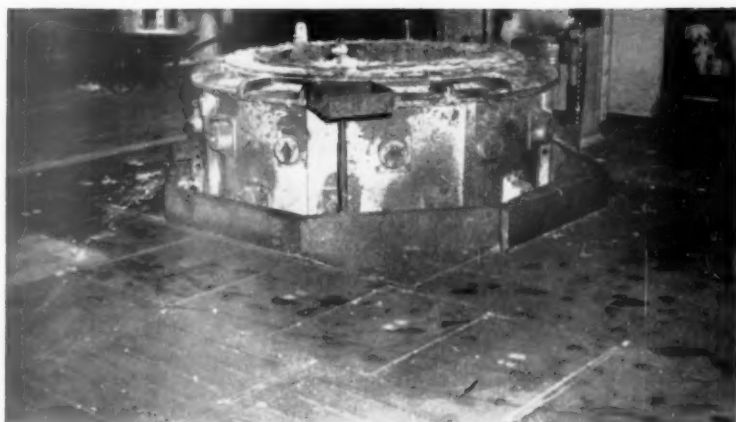


Figure 2. The area around the melting pot should be clean and free of tripping hazards.

at a safe location where combustible material will not be ignited by heat or by flying pieces of burning metal. Caution should be taken in igniting the scrap. Ordinary burnable refuse should be placed over it and ignited from a safe distance.

Handling Molten Metal

25. As with all molten metals, moisture and foreign material are dangerous in the presence of molten magnesium. Since magnesium does not attack iron, it can be melted safely in iron or steel vessels. It is a reactive metal and will reduce metals from their oxides or compounds. For this reason, all iron and steel furnace tools and implements must be free of oxide scales.

26. Steel pots in which magnesium is melted will become oxidized on the exterior from products of combustion, and a heavy scale or iron oxide will be formed on them. This scale breaks off and accumulates in the furnace bottom and must be removed at least once a week. If a pot breaks or begins to leak heavily, the reaction of the molten magnesium with the hot iron oxide scale will cause an explosion. Aluminized coatings on the exterior of pots and crucibles will minimize scale formation.

27. To prevent pot breakage, the pots should be removed from the furnaces and thoroughly cleaned at least once every 500

operating hours. Some companies recommend cleaning every 150 operating hours. The scale should be removed and the pots inspected for defects. The thickness of each pot wall should be measured, and if it has at any point decreased to one-half the original thickness, the pot should be discarded. Safety runoff containers should be provided for melting pots and crucibles.

28. The fluxes used in the melting of magnesium absorb moisture readily. Tools which are covered with flux and have not been dried properly may cause dangerous spattering of molten metal. Tools should be dried by being preheated. One method is to place the tools on the edge of a heated melting pot.

29. Permanent molds should be thoroughly preheated before pouring is undertaken, and all molds should be covered to prevent entry of foreign material or moisture before the molten metal is poured into them. Molds to be poured should be filled with sulfur dioxide gas, which is then replaced by magnesium. Thus, oxidation is stopped during the pouring process.

30. During solidification, the casting should be kept in a sulfur dioxide atmosphere or sulfur and boric acid should be dusted lightly over the surface exposed to the air. Sprues and risers should be protected in the same way. The

burning sulfur will form sulfur dioxide and prevent oxidation. Proper precautions should be taken in handling the sulfur dioxide.

31. When workers are die casting magnesium, precautions must be taken to prevent injury from metal which may be forced out of the mold during the initial shot. Workers should wear face shields or goggles and gloves. Flash shields must be provided.

32. In sand casting, the molds usually contain from three to five per cent moisture, which forms steam when the hot metal is poured into the molds. The steam will be decomposed by the metal, and the hydrogen liberated can form explosive mixtures. Magnesium will also react with the sand in the sand mold and form silicon or magnesium silicide liberation of considerable heat. *To prevent these reactions, inhibitors must be added to the molding and core sand mixtures.* These inhibitors include ammonium fluoride, boric acid, sulfur, and similar substances. Diethylene glycol is used to replace part of the water.

33. Emergency control over fuel and air lines to melting pot burners should be assured by the installation of master valves at a distance of not less than 25 feet from the pot.

34. Fire-resistive clothing, leggings, and gloves should be worn by all men working on melting pot or pour-off operations. Clothes can be made fire-resistive by being dipped in a 15 per cent solution of di-ammonium phosphate or ammonium sulfamate.

Clothing treated in this manner should be laundered every three to five days and then treated again. Only those chemicals which are nonreactive with burning magnesium should be used. Workers should be provided with and required to wear goggles, face shields, or other suitable form of eye protection.

35. Room ventilation should be provided and, where necessary, specific local exhaust ventilation should be installed.

36. The space around each melting pot should be entirely free of miscellaneous material and unnecessary obstructions. The area between the pouring crucible and the mold must be constantly checked for the presence of tripping hazards. Floors should be of hard-burned or vitreous paving blocks, cast iron or steel plate, and should be kept clean and free of moisture (Figure 2).

37. Automatic sprinklers should not be installed in melting and casting areas. Graphite powder, flux, or dry sand should be used to put out magnesium fires in such areas.

Machining

38. As used here, the term "machining" includes sawing, turning, chipping, drilling, routing, reaming, tapping, milling, shaping and similar operations. Dry machining is satisfactory in most cases. When fine cuts are taken at high speeds, where heat or excessive dust is generated, where high finish is needed, or when castings contain iron or steel inserts, a neutral, straight mineral oil coolant with low viscosity and high flash

point should be used. Soluble oil emulsions should not be used for ordinary machinery or cutting operations because it is difficult to recover chips contaminated with soluble oil. Also, the water content of the soluble oil emulsion greatly accelerates the reaction in case of fire. Vegetable oils are not recommended.

39. Chips must be kept free from water and from coolants containing fatty acids and should be stored and carried in closed steel containers to prevent wetting, oxidation, ignition, or contamination.

40. Ordinarily, the fire hazard in machining is slight, and if the worker has a sound knowledge of correct machining practice, ignition of shavings is unlikely. In order to ignite magnesium, it is first necessary to reach the melting point of the metal. Partial melting begins, depending on the alloy, at temperatures between 800 and 1200 F. In roughing operations, it is difficult to attain such temperatures, since the high heat conductivity of magnesium rapidly dissipates any frictional heat generated.

41. In finishing operations, however, where light shavings are necessarily produced, under certain circumstances temperatures sufficiently high for ignition may be reached. Factors which will tend to produce such temperatures, with possible ignition of chips or shavings are:

- a. Use of dull or chipped tools.
- b. Use of tools with small clearances and small chip spaces.
- c. High cutting speeds with fine feeds or cuts.

42. Sharp tools with ample clearance will greatly reduce the fire risk, as will coarser feeds, deeper cuts, and lower speeds. Where fine feeds and cuts and high speeds are essential to quality and economy of work, an approved liquid coolant should be used.

43. In turning operations, ignition may occur if the cutting is interrupted and the feed stopped while the work still revolves. In this case, the tool should be backed away from the work. In machining magnesium parts with inserts of ferrous metals, sparking sometimes occurs when the tools strike the inserts. In such instances, use of a lubricant has been found advisable.

44. Liquid coolants should be restricted to high flash point, neutral mineral oils. Water, water-soluble oils, and oils containing more than 0.2 per cent fatty acids should not be used because they may generate hydrogen. Magnesium chips and turnings wet with such coolants may ignite spontaneously.

45. As in all machining operations, proper eye protection, such as goggles or face shields, should be required.

46. Machinery, adjacent floor areas, pipes, ledges, window sills, and other places where dust may lodge must be frequently cleaned. Fines should be swept up regularly and placed in clean, dry, plainly labeled, covered metal containers provided for this purpose. The frequency of cleaning

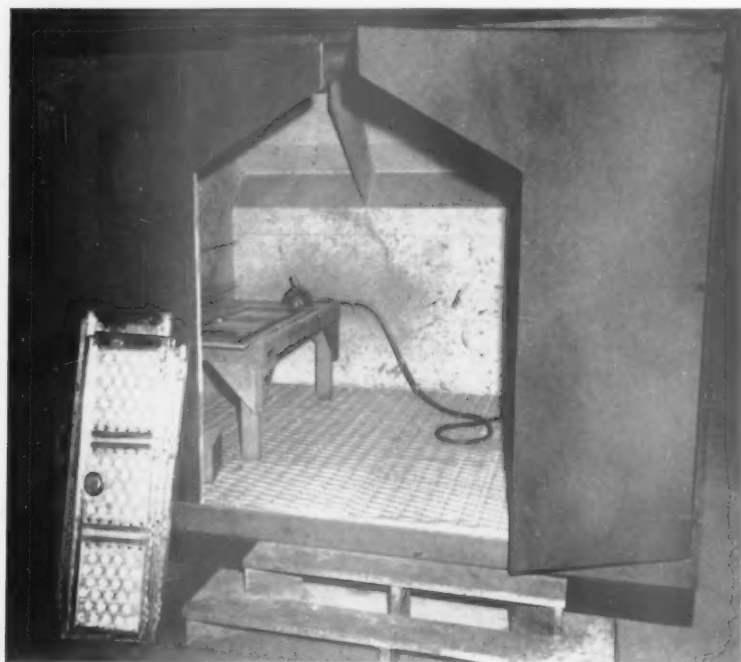


Figure 3. Approved wet type dust collector unit used in magnesium grinding and polishing operations.



Figure 4. Powdered soapstone for extinguishing small magnesium fires.

should be greater in shops where dry machining and considerable grinding are done, but in all plants periodic inspections should be made to assure that these areas are kept clean.

47. Machines should be provided with pans to catch the chips or turnings. The pans should be designed to permit easy removal from under the machines. Pans should be accessible not only for removal of chips but also for application of extinguishing powder in case of fire.

48. Chips, dust, and other magnesium scrap should not be mixed with regular floor sweepings. In sweeping and cleaning, care should be taken to minimize the dust concentration in the air. Special wet tank type vacuum cleaners are available commercially for this purpose. *Ordinary vacuum cleaners or dry collector units must not be used.*

49. In all areas where finely divided magnesium may be present smoking should be prohibited.

50. Open flames or hot sparks must be kept away from finely divided metal of any type. Welders and maintenance men should obtain approval from operating

department foremen before beginning work in machining areas.

51. A sufficient supply of a suitable fire-extinguishing agent should be immediately available. Machine operators, sweepers, and maintenance personnel should be especially trained in magnesium fire extinguishment since they are most likely to be in the immediate vicinity of fires occurring at machines. (See section on Fire Protection.)

Grinding, Buffing, and Wire Brushing

52. The main problem in grinding, buffing, and wire brushing operations is to prevent ignition of the finely divided magnesium.

53. Dust produced in such operations should *never* be collected in a dry type collector unit. It should be collected in an approved wet-type dust collector equipped with suitable hoods or enclosures (Figure 3).

54. Each collection unit should be so designed that the dust is drawn through a heavy spray of water and allowed to collect in a sump under water within the shortest possible distance from the point of origin. A large excess of water is necessary, and care

must be taken to prevent accumulations of damp magnesium dusts. Sludge pits should be well ventilated to insure the escape of any hydrogen formed by the reaction between the metal and water.

55. The sludge should be removed at frequent intervals to keep it well below the level of the liquid. Magnesium sludge that has been allowed to become partially dry is magnesium in its most dangerous form. Sludge should be removed with an excess of water and placed in covered, vented steel containers for removal to a safe location for disposal.

56. Sludge may be disposed of by being burned outdoors in a segregated area on a layer of hard-burned paving brick or fire brick with sufficient slope for proper drainage. The sludge should be spread in a layer three or four inches thick, and ordinary combustible refuse should be placed over it and ignited from a safe distance to avoid burns from possible hydrogen flash.

57. If chips or other forms of scrap are sold to scrap metal dealers, some method should be employed to mark containers of such materials for quick visual identification.

58. The power supply to machines should be interlocked with the exhaust air flow and with the liquid pressure level or flow in such a way that improper functioning of a dust removal and separator system will shut down the machine it serves.

59. All equipment must be permanently grounded to prevent accumulation of static electricity.

60. Repairs to dust collection systems should be made only after all residual dust has been removed. It is suggested that the accumulations of dry dust be sprayed with a light mineral oil or soaked with water before being removed. In cleaning the system, nonsparking tools and explosion-proof lighting equipment must be used.

61. Aprons of leather or smooth fire-resistive cloths equipped with nonferrous fasteners, should be

worn on grinding and other operations which produce fine chips, filings, or turnings. Since cuffs and pockets provide places for a dust accumulation, clothing without them is preferable. Wearing of fuzzy outer clothing should be prohibited. There should be no exposed steel parts in either clothing or shoes. Shoes conforming to *Specifications For Protective Occupational Footwear, Z-41, American War Standards* (American Standards Association, New York 17). Head covering should be worn to keep fine particles out of the hair.

62. Grinding dust which settles on clothing should be brushed off frequently. Clothing should be easily removable and fire-resistant (paragraph 34).

63. Eye protection such as goggles or face shields should be provided for the men who do machining, grinding, buffing, or wire brushing, and workers should be educated to wear this protective equipment.

64. Iron, steel, or other sparking material should not be ground either on grinding wheels used for magnesium alloys or in the immediate vicinity of such wheels. Grinding stands and tables on which grinding, buffing, and wire brushing are done should have tops of spark-resistant material. Wheels should not be allowed to become loaded. They should never be dressed on machines or in areas where magnesium is being buffed, rotary filed, or ground. Wheels should be removed and taken to separate wheel cleaning locations which are remote from magnesium dust and where special precautions are taken.

65. The entire area in which grinding, buffing, and wire brushing operations are done, including roof members, pipes, conduits and similar structures, should be systematically cleaned daily or as often as conditions warrant. Soft brushes and spark-resistant scoops and containers can be used. A fixed suction pipe and outlet vacuum cleaning system can also be used, provided that the separator unit is of the liquid precipitation type and provided also that the

suction piping system is of standard mild steel pipe and has standard recessed drainage fittings, with a check valve installed at each outlet.

66. Implements and hose used in connection with stationary vacuum systems should be completely grounded. A rupture diaphragm should be installed in the piping at its connection to the inlet side of the separator in such a way that a possible explosion in the piping may be safely vented to the atmosphere.

67. As in machining, smoking should be prohibited in all areas where finely divided magnesium is present. Open flames and hot sparks must be kept away. Welders and maintenance men should be warned of this fact and should be required to obtain approval from the operating foremen before beginning work in areas where the finely divided metal is produced.

68. All electrical equipment, including motors and lighting switches, must be of the type approved for use in hazardous locations, Class II, Group E, and installed in accordance with the requirements of Article 500 of the National Electrical Code.

69. A sufficient supply of suitable fire extinguishing agents should be immediately available. (See section on Fire Protection.)

Welding

70. Magnesium alloys can be welded by several methods, including arc welding, gas welding, and spot welding. Welding of magnesium should not be permitted where magnesium fines are present.

71. In electric arc welding, the entire weld area is shielded by an inert gas. Both helium and argon are used commercially for this purpose. The inert gas prevents rapid oxidation or burning of the molten weld bead by excluding air and replaces the flux normally used in other welding operations. Heat generated by the arc is rapidly diffused through the magnesium so that protection is required only at the bead.

72. Standard colored face shields or goggles must be used to protect the operator from the intense light of the arc.

73. In the gas welding of magnesium alloys, a flux is used to prevent oxidation of the metal. The usual safety precautions for gas welding should be observed.

74. In spot welding magnesium, no special safety precautions are necessary. The usual safe practices for electric welding should be observed, and face shields and gloves should be worn.

Heat Treating

75. Fires may occur in furnaces or ovens when magnesium is being heat-treated if the temperature is not kept uniform or if the surface of the work is not free from dust and fine particles of metal. Circulation of heated air in the furnace should be so controlled as to maintain a uniform temperature throughout the oven, to prevent the temperature in certain zones from exceeding that indicated by the thermocouples that operate the temperature-controlling devices. Water should not be used for cooling fan bearings, and no water or steam should be permitted to enter the furnace.

76. Ovens for heat-treating of magnesium should be tightly constructed. Two sets of temperature controls, operating individually, should be used. One should be adjusted to operate at a temperature slightly higher than the other. Then, if the first control fails, the other may be expected to operate before the magnesium in the oven ignites.

77. Heat-treating ovens should be provided with a 0.5 to 1.0 per cent sulfur dioxide atmosphere, which serves to retard the ignition of the magnesium. Furnaces and ovens should be designed in such a manner as to prevent direct radiation or direct contact of flames with materials being treated.

78. Magnesium parts to be heat-treated should be carefully inspected to be sure that they are free of magnesium chips, turnings, and sawdust because of the

ease of ignition of the finer particles of the metal.

79. Heat-treatment of magnesium in nitrate or nitrite baths should *never* be attempted. The chemical reaction between magnesium and molten nitrate or nitrite salts can cause a violent explosion.

80. Boron trichloride gas is effective in extinguishing magnesium fires in airtight circulating furnaces. The usual equipment consists of a cylinder or two of boron trichloride mounted on a hand truck. A neoprene hose from the cylinder to the steel pipe nozzle is used for introducing the gas through a porthole into the furnace. Where this gas is to be used, it is preferable to provide permanent fittings on the oven where the steel pipe nozzle can be inserted when required.

81. Infrared lights or electric heat elements are necessary to heat the tanks of boron trichloride and to insure a free flow of gas into the furnace. If heat is not used, the gas tends to freeze off.

82. Once a fire has started in an oven, the heating source of the oven should be immediately shut down, the infra red lights or heating elements on the tanks of boron trichloride turned on, and the gas introduced into the furnace. The circulating fans in the ovens should be run for a minute or two to insure an even distribution of the gas in the furnace, then shut off. The flow of boron trichloride should be continued until the temperature in the furnace decreases to approximately 700 F.

83. When boron trichloride contacts moisture, as in the atmosphere, hydrochloric acid and boric acid are formed. Therefore, care should be taken to prevent bodily contact, particularly around the eyes. If exposure is likely to be prolonged, as in the case of a fire involving the use of a large volume of this gas, workers fighting the fire should wear supplied air masks or gas masks with all-service or organic vapor canisters.

84. If use of boron trichloride is not feasible, fires in heat-treating furnaces may be combatted by the use of extinguishing pow-

der or compound on the burning materials after the rack has been withdrawn.

85. The area in front of each furnace should be equipped with iron or steel floor plates or hard-burned brick to receive drippings from the burning magnesium which has been withdrawn from the furnace. Where such floor plates or brick has not been installed, the adjacent floor should be covered with two inches or more of dry sand before the burning material is withdrawn from the furnace.

86. Water may be used to fight fire in combustible materials nearby, but not to fight fire in the ovens. Where automatic sprinkler protection is provided, there should be a deflecting shield or hood over the oven to prevent sprinkler water from getting into the oven.

87. Inasmuch as stress-relieving is accomplished at considerably lower temperatures than those required for heat treatment, the fire hazard is not as great in this operation. However, normal precautions should be taken, including the use of two sets of controls to prevent the possibility of overheating.

Chemical Treatment

88. A number of chemical treatment processes are available for the decoration and protection of magnesium alloys. In cleaning and treating processes, use is made of caustic soda, sodium dichromate, arsenous oxide, and phenol, as well as of nitric, sulfuric, hydrofluoric, chromic, and phosphoric acids. The precautions for handling these materials should be observed, and all treating tanks should be exhausted. The method of exhaust employed should conform to state and federal regulations governing the types of solution being used.

89. Relatively high voltages are used when certain anodic treatments are applied. Proper grounding of equipment and other safe electrical practices should be observed. Automatic power cutoff when a workman approaches the anodizing tanks is advisable.

90. Chrome-pickled surfaces showing the presence of gray powder (not normal) will produce flashes when struck against one another or by another object. Proper treatment control prevents this formation.

Fire Protection

91. Despite rigid control of molten or finely divided magnesium alloys, fires may occur. The control and proper extinguishment of these fires is a procedure which should be thoroughly understood. All employees should be given instruction in methods of preventing and extinguishing magnesium fires, and selected members of each shift should receive intensive training as special fire-fighting crews to assist the regular fire department or the municipal fire department.

92. Water, vaporizing liquid, foam, ordinary dry chemical, and carbon dioxide type extinguishers *will not extinguish magnesium fires*. Their use will accelerate burning and may cause an explosion.

93. Several compounds in granular or powder form or combined with organic liquid are available for use in extinguishing magnesium and magnesium alloy fires. Graphite powder, powdered pitch, heavy mineral oil, rust-free cast iron borings, powdered soapstone, flux, and dry sand are some of the materials that may be used to extinguish small or incipient magnesium fires (Figure 4). However, with the exception of the graphite powder, their use is limited.

94. The usual practice is to place containers or pumps filled with the extinguishing material near operations where fires are most likely to occur and to have additional quantities located at strategic spots in the plant. The dry material should be kept in plainly labeled, covered metal pails with easily removable covers. A hand scoop should be provided at each pail for applying the material to a fire.

95. The amount of extinguishing material needed will depend

on the quantity of chips or turnings involved. Where a fire requiring a large amount of extinguishing compound may occur, the material should be kept in drums, with long-handled shovels provided for its use. Heat-resistant gloves and face guards should be available for the protection of personnel applying the material.

96. Extinguishers which mechanically apply dry chemical extinguishing powders on the burning area with force are not recommended. However, a satisfactory pump has been developed for graphite powder.

97. Where one of the proprietary compounds is used, the recommended method of applying it is as follows:

a. Spread the extinguishing compound evenly over the surface of the fire without scattering the burning metal. Use enough powder to provide a $\frac{1}{2}$ - to $\frac{3}{4}$ -inch layer.

b. Continued smoking in spots will indicate that the fire is still burning in those areas. Gently stir in more compound to bring it into contact with the fire.

98. A slight variation of the mixing procedure is recommended for small magnesium alloy fires on combustible surfaces:

a. The fire should be covered with a layer of the extinguishing compound. A layer of the compound, at least two inches deep should be spread on the combustible surface near the fire. The burning metal should then be immediately shoveled onto the layer of extinguishing material, and more compound should be added as needed.

b. If the fire continues to burn violently, it should be covered with additional compound. However, if the fire is almost out, it may be completely extinguished by mixing the bottom layer of the compound with the metal that is still burning.

99. If a clean, dry, iron container is available, the fire should be covered with a layer of extinguishing material and the burning metal and compound should

be immediately shoveled into the container to confine the burning magnesium.

100. Safety fire showers and fire blankets are necessary precautions in case of clothing fires. Clothing containing burning magnesium should be removed before attempts are made to smother the flames. Fire showers must be easily accessible and yet not dangerously close to molten metal. Aisles leading to deluge showers, as well as the showers themselves, should be clearly marked and kept free from obstructions.

101. Water may be used to control burning of surrounding flammable material, but solid streams of water should not be used on magnesium fires. Warning signs to this effect should be posted throughout the plant, and local fire department personnel should be instructed accordingly. All precautions possible should be taken to prevent excited operators from using the wrong methods of fire control and creating needless hazards.

102. Methods of controlling fires in heat-treating ovens with boron trichloride are discussed under heat treating.

First Aid

103. All cases of injury from molten magnesium or from particles of magnesium of any type should receive first-aid treatment. In addition, any serious burn or mechanical injury should be referred to a physician for proper follow-up.

Respiratory Protection

104. There have been no reports of industrial intoxication from inhalation of magnesium metal powder or magnesium oxide. Upon exposure, magnesium oxide is irritating to the eyes, nose, and throat, but the material is not a severe primary irritant.

Spot Tests for Magnesium

105. In the construction or assembling of certain machinery or equipment, magnesium or one of the alloys having similar properties may have been used for only a few of the component parts, and where finished or painted products are being stored or handled,

it may be difficult to determine what percentage is magnesium. Silver nitrate, caustic soda, vinegar, or acetic acid can be used to distinguish between parts composed of magnesium and those composed of aluminum.

106. A silver nitrate test solution may be prepared by dissolving about five grams of silver nitrate in one liter of distilled water. The portion of metal to be tested is first cleaned of grease, dirt, oxide, etc. by abrading with sandpaper or steel wool. After the test area has been prepared, a drop of the test solution is placed on it. A black coloration is immediately produced on magnesium or magnesium alloys. No coloration is noted on aluminum and its alloys or on most other metals, except for zinc and cadmium which show a similar coloration.

107. A 10 to 20 per cent caustic soda solution will give a bubbling reaction on contact with aluminum but it will not affect magnesium.

108. Vinegar or acetic acid solutions caused a bubbling reaction on magnesium with no effect on an aluminum surface.

REFERENCES

Standards of the National Board of Fire Underwriters or The Storage, Handling and Processing of Magnesium, published by National Board of Fire Underwriters, 85 John St., New York 38.

Data on grinding tools can be obtained from manufacturers of magnesium metal alloys or from the National Safety Council.

For specific flux or inert gas to be used, publications of a magnesium alloy manufacturer should be consulted.

Specific information on extinguishing powder and extinguishing gases, can be obtained from technical data published by magnesium manufacturers. Information will also be furnished on request by the National Safety Council.

Additional detailed information regarding magnesium machining practices, melting procedures, heat-treatment, and fire prevention may be secured from magnesium manufacturers.

ACKNOWLEDGEMENT

This Data Sheet was prepared by the Metals Section, National Safety Council. It has been extensively reviewed by Council members and approved for publication by the Publications Committee of the Industrial Conference of the National Safety Council.

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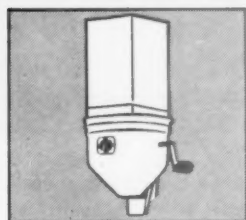
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PAX WORK BENCH BRACKET

(Pat. Pend.)

The PAX WORK BENCH BRACKET is the best and surely the most economical means of expanding "Waterless" wash up facilities throughout the plant. A dispenser located on the work-bench eliminates completely the time loss of employees walking to and from not quickly reached wash stands or wash rooms.



Your plant should be equipped with PAX C-P DISPENSERS and PAX WORK BENCH BRACKETS and gain all the advantages of modern equipment.

For EXTRA SAVINGS with SAFETY, SATISFACTION and TRUE IN-USE ECONOMY have your PAX representative or jobber show you the complete line of PAX SKIN CLEANSERS and other skin care products.

The PAX C-P Dispenser and accessory equipment is protected by patents or patents pending.

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SAFETY OFF THE JOB

Suggestions for company and community programs

By Gordon T. O'Neill

NSC Staff Representative, OTJ Safety Committee

New Kind of Safety Hat

"Milady's Bonnet With All the Hazards On It" was a half-hour fashion show presented to the clerical group of the Louisville Works, E. I. DuPont De Nemours & Co., by the Home Division of the Louisville Safety Council. Aimed at off-the-job injury prevention, the program was given in three separate presentations with 15 Louisville Works girls as models. Each girl displayed a different hat as the narrator explained its reason for being. For example: "This brown felt, off-the-face creation, with tiny throw rug medallions, bears a warning to give all scatter rugs the non-skid treatment." Single copies of a similar program are available from the National Safety Council.

OTJ Safety Meetings During Work Hours

The Lever Brothers Company of Baltimore conducts monthly departmental safety meetings, at which specific items on off-the-job safety are discussed. At the same meetings, any recent off-the-job accident reports are presented. Their plant safety posters include off-the-job hazards as well as on-the-job hazards. The plant has found that direct personal contact at departmental safety meetings and during work hours has been a great benefit in their off-the-job program. In the past when they had worker safety committee meetings, they found that the information either did not get back to the department or did not impress the individuals.

Every Angle Covered

The activities of the Electrometallurgical Company of Niagara Falls include: Monthly letters sent to the homes of all employees on some subject of off-the-job safety or home safety. In addition, pertinent literature relative

to the subject being discussed is enclosed. The plant monthly magazine also features articles on off-the-job safety and is mailed to the homes of all employees. Safety films are shown periodically to the employees at plant safety meetings and off-the-job safety is discussed at the employee meetings conducted by supervisors. Outdoor safety billboard signs are posted at main plant entrances and are changed monthly. The general theme of the signs is off-the-job safety and reminders of highway and home hazards. The Plant Safety Department makes inspections in public buildings, where requested, such as school shops, etc. Members of the safety department are available to show safety films and as speakers for outside civic organization programs.

Ordnance Works Stages Safety Conference

The Charlestown, Ind., Ordnance Works safety convention has been most beneficial for promoting off-the-job and home safety. Approximately 120 delegates representing the different safety

meeting groups of the works met together for two full working days and exchanged their ideas with management and with each other on four separate safety subjects. The second morning of the convention was devoted exclusively to off-the-job safety with the emphasis being given to safety in the home.

During this session, as in the others at the convention, a member of management gave an introductory or keynote talk to focus group thinking on certain aspects of the subject in question, and to provide a background for the discussions to follow. A film titled "Home, Safe Home" was shown to the delegates who were then divided into previously assigned discussion groups under the guidance of a leader trained in discussion leading techniques.

The convention had a pronounced effect on the delegates who have since become very enthusiastic "safety salesmen" in their respective groups. They have held safety meetings and actively worked toward disseminating to others the things they learned in the convention.

First-aid Instruction For the Family, Too

The Cardwell Manufacturing Company, Inc., of Wichita, Kan., feels that when people fully understand the results of an accident they are then interested in the causes. Thus they have a continuing interest in first-aid training. Supervisors and other employees have had first-aid training through the Red Cross. In addition many wives have had standard first-aid through P.T.A. and other classes, usually given by one of five company first-aid instructors. They feel the wife and family need to give some time and work to learning about home and highway safety and that P.T.A. programs are good.

Wives Take Oath

Wives and husbands of employees of the Louisiana Power and Light Company, New Orleans, attend safety suppers at which home safety is stressed. "Home Safety Director" certificates are given wives at these



"If you would only give me some of the money you spend on taxes I could do a much better job of running the house."

safety suppers, after they are "sworn in" as home safety directors. The company feels the administering of the oath in connection with the awarding of home safety director certificates has effectively impressed the wives with the importance they play in the safety of their husbands and families, both at home and on the job.

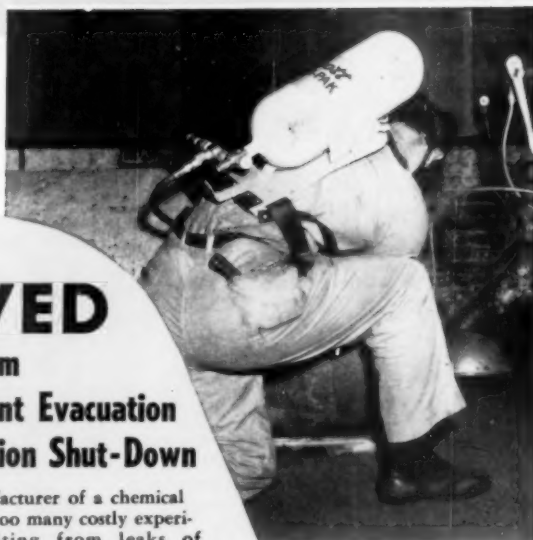
Postcards and Letters To Employees' Homes

The International Harvester Company of Louisville, Ky., sends postcards depicting various suggestions for home, public and traffic off-the-job safety to employees' homes, with a personal message from the employee's immediate supervisor. The plant has a regular organized home safety committee consisting of five people who are appointed by the works management. The committee meets monthly and submits committee reports to the works manager and to the Louisville Safety Council. The object of the committee is to plan and activate a home safety program. Their activity is part of a long range program and is initially devoted to making a survey to determine the needs of the program. They are currently preparing a letter, to be signed by the works manager, which will be sent to all industries in the locality requesting that these industries send in complete information regarding their home safety programs. After the completion of this survey, an over-all program will be designed for the community, copies of which will be sent to all of the industries.

Safety Clinic for Kids

The United States Vanadium Company of Bishop, Calif., conducted a safety clinic for employees' children which was held during the summer. This clinic consisted of 5 one and one-half hour sessions spread over a two-week period. Various topics stressed were first aid, artificial respiration, fire prevention, use of fire equipment, bicycle safety, and safety at play.

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Now—equipped with Scott Air-Paks, repairmen are able to make quick repairs with complete breathing safety. Evacuation of personnel is unnecessary. Result: no lost time—no production losses. The Scott Air-Paks have paid for themselves many times over!

Do you have a similar problem? Then write for the free booklet "Scott Air-Paks Save Money, Man Hours and Men for Industry."

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INDUSTRIAL HEALTH



Abstracts of current literature

on Occupational Hygiene, Medicine, and Nursing

By F. A. Van Atta, Industrial Department, NSC

Dust Control in the Granite Industry

Silicosis and Dust Control, Vermont's Granite Industry, by Harry B. Ashe. *Public Health Reports* 70:983-985 (October, 1955).

QUARRYING AND CUTTING granite has been a large industry in Vermont for many years. Pneumatic tools came into general use between 1895 and 1900, accompanied by a tremendous increase in dust production as compared to that produced by the use of hand tools. Dust control in the industry practically had its beginning in 1937 so that there was a period of about 40 years of great dust production.

The Division of Industrial Hygiene in the Vermont Department of Health was created in 1937 and began a yearly X-ray program and a program of dust suppression in the granite industry which it has carried out persistently. At that time dust exposures were probably similar to those reported by the Public Health Service in 1924 and to 1926 when concentrations up to 200 million particles per cu. ft. of air were found and granite cutters averaged an exposure of about 60 million particles per cu. ft. of air. Recent dust counts indicate very few individual operators exposed to more than five million particles per cu. ft. of air.

During 1937-1938 the Division of Industrial Hygiene X-rayed 805 granite workers for the first time by encouraging the men to come to the division office during their time off from work. The 805 men X-rayed represented approximately one-third of those employed in the granite manufacturing industry and of these 365 (45.3 per cent) had silicosis and 143 (17.9 per cent) had silicosis with possible infection. The infection where it existed can be presumed to be tuberculosis.

From 1938 through 1950 X-ray clinics were held for granite workers in the evening in the division office and the number availing themselves of the service gradually increased. In 1951 a mobile X-ray unit was set up which could be carried to the work places and the X-rays were done on company time. By these means the number of men with X-ray records has been increased to 93.9 per cent of those on the payroll. At the same time the number with silicosis has decreased continuously since 1937 so that in 1954 16.2 per cent were found with silicosis and 2.3 per cent with silicosis plus possible infection.

No cases of silicosis have been found in persons who have been employed in the granite industry only since 1937. This is a remarkable record of the reduction and probable elimination within a few years of a severe industrial disease and it is undoubtedly mainly due to effective dust control within the industry.

Safer Auto Design Will Save Heads and Lives

Prevention, the Only Cure For Head Injuries Resulting From Automobile Accidents, by C. Hunter Shelden. *The Journal of the American Medical Association*, 159:981-986 (November 5, 1955).

NEUROSURGEONS are seriously involved in the campaign against injuries resulting from automobile accidents because head and neck injuries account for nearly 70 per cent of all automobile injury fatalities. Since the human brain enters an irreversible reaction whenever it has been traumatized beyond a certain point the only method of preventing the fatalities is to prevent the injuries.

Elimination of the mechanically hazardous features of interior construction of automobiles would prevent about three-quarters of

the fatalities, even if none of the accidents were prevented.

This is illustrated in a way by the stock car races in which the frequent crashes are the main attraction and in spite of the frequent crashes injuries are quite rare. They are rare because most of the injury-producing factors present in the average automobile have been eliminated. Doors are rigidly shut and the seats are welded or rigidly fixed to the automobile frame. Projecting knobs and handles are removed and rolling hoops and rigid interior roof supports are installed. The use of seat belts, crash helmets, and shoulder harnesses also protects the drivers.

From one fourth to one third of all automobile crash fatalities occur as a result of persons being thrown out through doors which have sprung open. The average door lock will fly open if the frame is sprung only slightly over one-half inch. The two-door hardtop is particularly vulnerable to distortion of the body because of the lack of a post in the middle of the body and the new four-door hardtop will probably prove to be even more vulnerable.

Development of a method which would rigidly attach both of the doors of a two-door to the outsides of the front seat would probably increase the rigidity of the whole structure as well as preventing the front seat from flying forward in case of a crash.

The seats also add substantially to the number of severe injuries in automobile crashes. The cushions of the rear seat are usually either loose or only lightly fastened and can fly forward to strike the passenger in the front seat and the fixation of the front seat in such a manner that it can be adjusted backward and forward and up and down is usually

—To page 166

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Extension Ladder with ladder jack makes a dependable stage support for painting windows and other work. "Gold Medal" Safety Extension Ladders are approved by U.L.



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Safest Step Ladder made the "Gold Medal" Safety Platform Ladder features a 14" x 19" platform plus a slotted tool rack at the top. Tools can't drop off and injure workers or machinery; man on ladder can safely work in any direction using both hands. Approved by Underwriter's Laboratories, Inc.



Lightweight Aluminum Ladders make handling easy, safe. Single ladders to 20', aluminum extension ladders to 40', step ladders to 8'.



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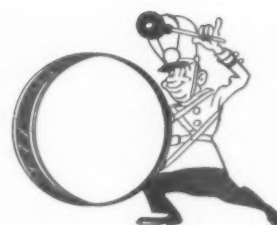
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SHOWMANSHIP IN SAFETY

By Jim Saul

Editor, Industrial Department, NSC



The winner of the first Ronson Adonis lighter is Jim Amos, of the Nashville plant of the Ralston Purina Company, for his story, "Spin for Safety," in last month's issue.

You, too, can win a Ronson lighter. Send us a story—words and pictures—of how you use showman-

ship in your safety program. The best contribution each month takes an attractive Adonis lighter. At the end of 1956 we will award the best of the year's showmanship stories a Parker 51 desk set. See page 4 of the January NEWS for pictures of the lighter and pen set.

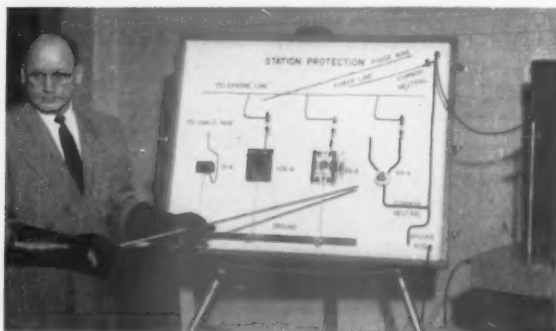


Shocking Story

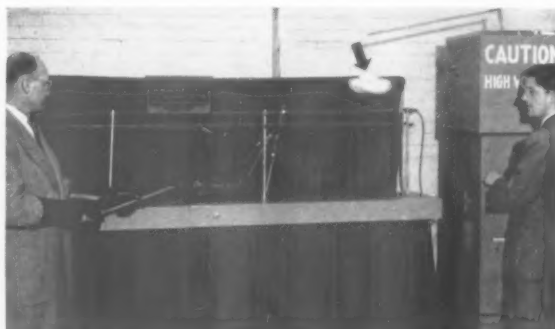
A vivid demonstration developed by the Wisconsin Telephone Company to show plant forces the electrical hazards they will meet in the field helps explain why the communications industry turns in an outstanding safety record year after year.

The presentation, devised by the company's transmission division, teaches plant men on construction jobs how to avoid the hazards of high voltages and lightning by duplicating actual field conditions. A scale pole line model demonstrates joint usage by telephone and high-voltage power circuits and a series of panels on which are mounted items of standard telephone equipment illustrates what happens when a high-voltage power line gets too close or touches telephone circuits.

The Bell System's motto, mounted on a plaque on the pole line model, reads: "No job is so important and no service so urgent that we cannot take time to perform our work safely."



Wearing rubber protective gloves, Mr. Saari points to one of a series of panels which attach to the left of the pole line model. This display demonstrates the new fuseless station protectors used by Wisconsin Telephone Company. Good grounding is stressed.



L. V. Saari, Engineering Department, shows how improper pole setting near an energized conductor can cause an accident. Lineman (represented here by small model opening truck door) can suffer a high-voltage shock when pole touches power line overhead and completes the circuit through the truck. J. E. Kane operates controls at cabinet at right where high voltages for the demonstration are developed. Most spectacular is a lightning flash from cloud (arrow) to the lines.

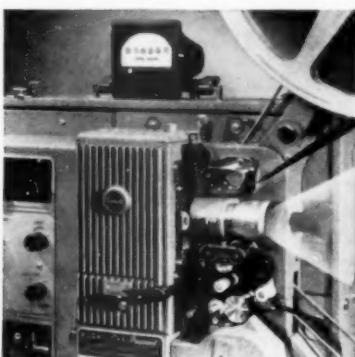


Hand-painted scenic background illustrates a new pole guy ground- ing technique being used along aerial cable runs.

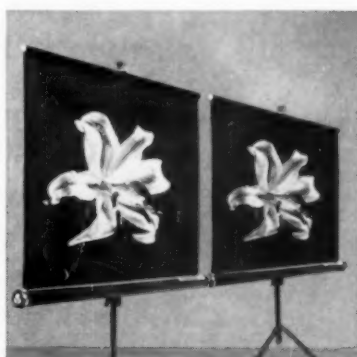
These basic projector advances can make films more useful in *your* business



1. Easy setups. Unfold the Kodascope Pageant Projector's arms into position—there are no screws or fittings to fiddle with. Drive belts are attached, ready for use. Then thread the film, following the clear, simple diagram on the projector base, and start your run.



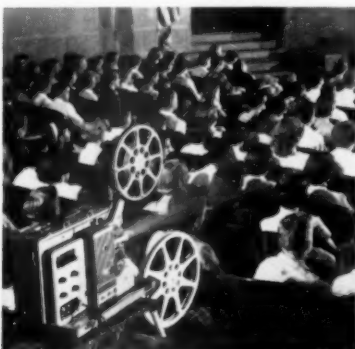
2. Simple maintenance. Kodascope Pageant Projectors are *permanently lubricated*—you bypass the danger of improper oiling, main cause of breakdowns. Stock machines in independent tests have run without stoppage or oiling the equivalent of 2½ years of normal use!



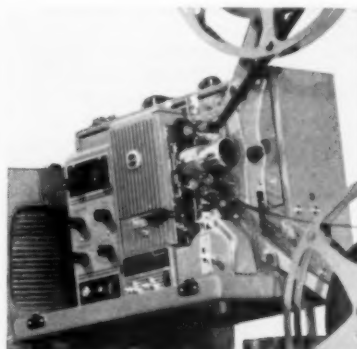
3. Extra-bright pictures. The Pageant's Super-40 Shutter automatically provides over 40% more screen light at sound speed than standard shutters. This lets you use big screens, long throws, and even leave enough room light for note taking.



4. Natural sound. The Pageant's efficient amplifiers (with tone and volume controls) matched with *well-baffled* speakers fill your room or auditorium with clear, comfortable, realistic sound. When you wish, you can plug in a "mike" or phonograph, too.



5. Wide versatility. With the Super-40 Shutter you can show silent—as well as sound—speed movies. And to meet your needs exactly, you have your choice of 7- or 15-watt amplifiers and 8- or 12-inch speakers in every practical combination.



6 Best value. Make us prove it. Don't be satisfied until you've seen the brilliant Pageant performance—on your own screen. Ask your Kodak Audio-Visual Dealer for a demonstration. Or send us the coupon. There is no obligation.



BEFORE YOU DECIDE on any projector, be sure to get complete information on the forward features of the new Pageant. Cut out coupon for this fact-crammed booklet now!

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Please send me complete information on the new Kodascope **PAGEANT** 16mm Sound Projectors, and tell me who can give me a demonstration. I understand I am under no obligation.

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THE SAFETY LIBRARY



Books, pamphlets and periodicals of interest to safety men

Compiled by Ruth Parks, Librarian, NSC

Wind—Friend or Foe?

Man and the Winds, by E. Aubert de la Rue, translated by Madge E. Thompson. Published by Philosophical Library, 15 E. 40th St., New York 16; 1955; 206 p.; illus.; index. Price \$6.

THIS BOOK deals with wind from point of view of human geography rather than meteorology. It provides some fascinating and informative reading.

Wind has been called "the friend of man." For centuries it has driven ships and turned mills but these services are small in comparison with its greatest benefit. It is the wind which circulates over the land the immense masses of water vapor evaporated from the sea, bringing the rain and moisture which makes land habitable.

But wind, the author points out, is a friend whose benefits are dearly bought—with terrific destruction in some regions. For a long time wind was considered a capricious and inconstant element. Progress of meteorology has shown that it obeys well-defined laws. This knowledge has been of immense value, particularly in aviation and navigation. Through it man is better able to protect himself against the violence of the wind.

The author sees in the wind a possible future source of power when harnessed by devices more efficient than the old-fashioned windmill.

CARMAN FISH

BOOKS AND PAMPHLETS

Aeronautics

Actuarial Approaches to Safety. Jerome Lederer, Society of Automotive Engineers, 29 W. 39th St., New York 18. 1955. 16p. and tables. Preprint No. 503. 35c to members.

Chemicals

The Halogenated Hydrocarbons Toxicity and Potential Dangers. W. F. von Oettingen, U. S. Dept. of Health, Education and Welfare, 1955. 430p. Public Health Service Publication No. 414. \$2.50. For sale by the Superintendent of Documents, Washington 25, D. C.

Construction

National Building Code. National

Board of Fire Underwriters, 85 John St., New York 18. 1955 edition. 322p., plus Fire Resistance Ratings, 50p. Free.

Fire Protection

Fire Protection Standard Recommendations. Ernest Benn Limited, London, 1955, 157p. \$2.00. Available in the United States from John de-Griff, Inc., 64 W. 23rd St., New York 10.

Food Industry

Occupancy Fire Record—Bakeries. National Fire Protection Association, 60 Batterymarch St., Boston 10. 1955. 8p. Fire Records Bulletin FT 55-8. 50c.

Petroleum Industry

Occupancy Fire Record—Gasoline Service Stations. National Fire Protection Association, 60 Batterymarch St., Boston 10. 1955. 8p. Fire Record Bulletin FT 55-9. 50c.

Radiation

Transportation of Radioactive Materials. Handbook of Federal Regulations. U. S. Atomic Energy Commission, 1955. 48p. 25c. For sale by the Superintendent of Documents, Washington 25, D. C.

Warehouses

Occupancy Fire Record—Cotton Warehouses. National Fire Protection Association, 60 Batterymarch St., Boston 10. 1955. 8p. Fire Record Bulletin Fr 55-7. 50c.

MAGAZINE ARTICLES

Absenteeism

A "Human Relations" Approach to Sickness. Absenteeism and Other Employee Problems. Leo Wade, AMA Archives of Industrial Health. Dec. 1955, p. 582.

Accidents

Accidental Death Related to Industry. Jean Spencer Felton, Industrial Medicine and Surgery, Dec. 1955, p. 524.

Chemicals

The Acute Toxicity of the Vapors of Some Methylated Hydrazine Derivatives. Keith H. Jacobson and others, AMA Archives of Industrial Health. Dec. 1955, p. 609.

Comparative Toxicity of Boranes.

George J. Leomskas, Industrial Hygiene Control. Dec. 1955, p. 280.

Determination of Hydrazine and Ammonia in Air. Herbert McKennis, Jr., AMA Archives of Industrial Health. Nov. 1955, p. 511.

Fatal Poisoning with Sodium Fluoroacetate. John L. Brockman and others, Journal of the American Medical Association. Dec. 1955, p. 1529.

Inhalation Toxicity of Chlorine Trifluoride. Henry J. Horn and Robert J. Weir, AMA Archives of Industrial Health. Nov. 1955, p. 515.

Studies on the Toxicology of N-Nitrosodimethylamine Vapor. Keith H. Jacobson and others, AMA Archives of Industrial Health. Dec. 1955, p. 617.

Toxicologic Studies on Trimethyl and Triethylphosphites. William Rockhold and others, AMA Archives of Industrial Health. Nov. 1955, p. 483.

The Vapor Toxicity of a Composite Solvent and Its Principal Components. Charles W. La Belle, AMA Archives of Industrial Health. Dec. 1955, p. 623.

Conferences

Why Attend Safety Conferences? Cherry Parker, Nursing Outlook. Dec. 1955, p. 660.

Deafness

Occupational Deafness. Abraham I. Goldner, AMA Archives of Industrial Health. Dec. 1955, p. 643.

Dusts

Sampling and Analysis of Industrial Process Dust. Karl Westlin, Industrial Hygiene Quarterly. Dec. 1955, p. 283.

A Unique Wet Collector for Lightweight Aggregate Dusts. Harry E. Seifert, Industrial Hygiene Quarterly, Dec. 1955, p. 301.

Fertilizer Industry

Safety—Problem Child of Industry. C. O. Barnard, Agricultural Chemicals. Dec. 1955, p. 38.

Health

Occupational Health Problems in an Industrial Society. Stafford L. Warren, The Journal of the American Medical Association. Dec. 24, 1955, p. 1581.

Planning a Health Center. Richard MacDiarmid, Industrial Medicine and Surgery. Dec. 1955, p. 541.

Some Aspects of Liver Diseases Caused by Industrial Poisoning. James H. Thompson, AMA Archives of Industrial Health. Nov. 1955, p. 523.

Studies in Vanadium Toxicology.

—To page 124

Now it's Puddle-Proof



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We couldn't improve the styling in this smart, brown, plain toe safety oxford. But we could and did improve its utility. Now the smoothly contoured uppers are cut from genuine Sylflex tanned leather. And the sole welting is also a Sylflex tannage. This simply means that those who wear the Iron Age 620 now get the added value of a moisture-resistant construction. And most everyone knows what Sylflex means in terms

of greater comfort and longer wear.

All other quality features such as Seiberling Oil-Pruf sole and heel, Dacron stitching, Pacifate vamp lining and leather toe lining are retained. So is the number. It's still "620"—too popular for us to change, so easy for you to remember.

Get your stock order in now. Let your people start enjoying the added benefits that Sylflex tanned leather alone provides.

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CONSULTATION CORNER

By George MacDonald

Senior Consulting Engineer, Industrial Department, NSC

Got a problem in accident prevention or occupational hygiene? Questions are answered by mail, a few of general interest being selected for publication here

Magnesium Ladders for Home Use

Question. For some time I have been shopping for an aluminum or magnesium ladder for use around my home. This inquiry is prompted by the remark of one dealer who stated that the National Safety Council had condemned magnesium ladders as unsafe.

Can you supply me with comparative test or performance data on aluminum and magnesium ladders that I may be guided accordingly?

Answer. The National Safety Council does not condemn magnesium or other metal ladders as unsafe. A properly made light metal ladder is a very handy thing to have around the house, and I can see very little to indicate that it is unsafe for such use.

I would say that the one great hazard in the use of portable metal ladders is the possibility of contact of the ladder with an exposed electrical conductor. However, this possibility occurs principally in industrial use. In the home, there is almost no chance of touching any exposed electrical conductor while carrying a ladder.

We have nothing to indicate the relative merits of magnesium and aluminum ladders. Both, if properly made, are equally sturdy and strong.

Of course, with a metal ladder, as with a wooden ladder, the usual safe practices are required. Step ladders should be fully open to position with cross-braces locked, the ladder should be placed on an even, solid foundation, and one should never stand on the top step to work. There are, of course, a number of other

safe practices to be observed, but, actually, these have nothing to do with the type of construction of the ladder.

Company Policy for Use of Airplanes

Question. I am starting a procedure to establish a company policy for use of airplanes by our personnel. Can you advise me where to write for such information?

Our policy would include restrictions for top management personnel in using planes for company business, including private or rented planes as well as commercial air lines.

Answer. You are considering a program which is already very extensive in American business. In fact, business aircraft flying has reached the point where annual mileage exceeds that of the scheduled airlines. To provide you with some specific information as to the thinking of one company in this respect, I am enclosing tear sheets from our 1949 National Safety Congress Transactions which contain the presentation on "Aviation Safety in the Petroleum Industry" by Henry W. Boggess.

Mr. Boggess is not only active in the Sinclair Company's safety program but he also heads the National Business Aircraft Association. This organization has done considerable work in compiling recommendations which you seek. I suggest you contact the association at 1701 K Street, NW, Washington 6, D. C.

Another organization which might offer worthwhile recommendations is the Flight Safety Foundation, 471 Park Avenue, New York 22.

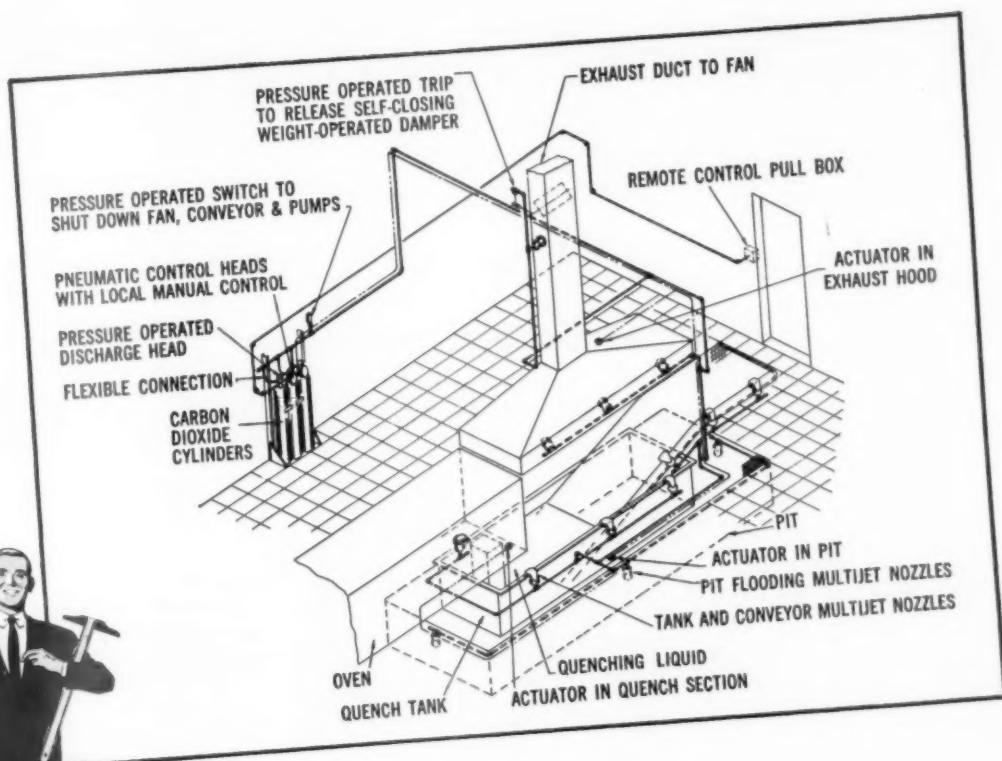
Emergency Lighting System

Question. Our local power source failed during a recent storm and threw our plant powerhouse into total darkness. Our engineer fell over a piece of machinery while trying to find an electric lantern at the control board. Fortunately, his injury

—To page 179



"I'm not bleeding—I just put red coloring in the coolant to break the monotony."



HAZARDS LIKE QUENCH TANKS... NEED THIS SPECIAL FIRE PROTECTION!

IN THE PLAN ABOVE, you see a typical Kidde fire extinguishing system installation for the protection of one of industry's most dangerous fire hazards. However, *all* Kidde quench tank installations are not exactly like this one, since Kidde treats each quench tank as a *special* hazard which requires *special* fire protection!

Using safe, efficient carbon dioxide, Kidde systems snuff flames quickly, cleanly. The CO₂ leaves no mess to harm machinery or equipment, will not even damage work-in-process. And, thanks to patented Kidde rate-of-temperature-rise detectors, Kidde systems remain on guard 24 hours a day, completely independent of outside power sources.

Kidde systems use no clumsy mechanical triggering methods, have no falling weights. Pneumatic or Electrical Control Heads insure instant and complete CO₂ discharge. The moving parts of a Kidde

system are self-enclosed for safety, need no replacement after a fire, have easy-to-read visual indicators which show at a glance if system is "set" or "released." What's more, special Directional Valves on the Kidde system let you protect more than one hazard from the same cylinder bank, giving you the most versatile protection on the market today!

Without obligating yourself in any way, let the Kidde man analyze the fire hazards in your plant. Then let him show you our recommendations. For more information, write Kidde today.

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SEE YOUR DISTRIBUTOR, OR SEND COUPON TODAY!

S. G. Taylor Chain Co., Hammond, Ind.; Pittsburgh, Pa.



S. G. Taylor Chain Co.
Dept. K Hammond, Indiana
Please rush Bulletin No. 90 giving all the facts
and specifications on Tayco Hooks.

Name
Address
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EDISON L. WHEELER
1887-1955

There is, perhaps, no better measure of a man's character and worth than his standing among his competitors. Among them Edison L. Wheeler won an honored and established place during his busy and useful life.

His passing on October 31 removes a colorful and lovable personality from the safety equipment field. As founder and president of Wheeler Protective Apparel, Inc., Chicago, he was a pioneer in the design and manufacture of protective equipment. To his work many an industrial worker owes escape from crippling, disfiguring or even fatal injury.

The industry also owes him a debt of gratitude. Those who entered the field later have benefited immensely from the missionary work of safety's pioneers. Ed Wheeler's standards and ethics were high, and to do business with him either as competitor or customer was to become his friend.

He was a past president of the Industrial Safety Equipment Association and his leadership did much to expand the association's leadership. His interest in safety also found an outlet in the National Safety Council, on whose board of directors he served, and in the Veterans of Safety.

His hobbies were another indication of his many-sided personality. He was widely known for his skill in naturalistic rock work and landscaping and was also active in

the Friends of Native Landscape. His ability as a toastmaster and singer added to the enjoyability of many a gathering.

Fortunately for all of us, the good work that men do lives after them. Ed Wheeler's influence will continue in the organization he guided so ably for many years and wherever men must be protected against the hazards of their occupations.

J. B. DAVIES, *President*
Industrial Safety Equipment
Association

Welding Show to Feature Health and Safety Session

AN INNOVATION of the Fourth Welding Show, sponsored by the American Welding Society, will be a discussion of safety, health, and fire prevention by the society's technical activities committee.

To be staged May 9-11 in the Memorial Auditorium, Buffalo, N. Y., the exposition will be the largest ever held in the industry.

Coincident with the show, the society will conduct its annual business meeting and a series of technical conferences. The metals engineering division of the American Society of Mechanical Engineers will, for the first time, join the American Welding Society in sponsorship of four sessions in which both groups have a mutual interest.

The welding committee of the Atomic Energy Commission also will co-sponsor a session.

Twenty-one technical sessions, with approximately 50 speakers are planned. Included will be a Welding Conference, which will consider practical aspects of welding for industrial executives, and a series of educational lectures for engineering students.

Technical papers will be read, and business sessions of the society will be conducted, at the Hotel Statler. The Auditorium will be used for the exhibits, the educational lectures and the Welding Conference.

Advance registration forms and hotel information may be obtained by writing the American Welding Society, 33 W. 39th St., New York 18.

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for plant safety...

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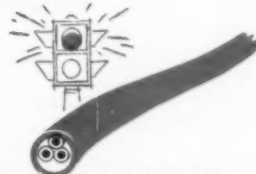
*injects color in portable
cord to minimize accidents
... cut maintenance costs!*

*Mill
Duty

Indoors or outdoors...Type MD* RED-D-PRENE carries current wherever you want it, *safely* and at *lower* cost. First designed with tough, oil-resistant Neoprene sheath in Industrial Red...easily seen and recognized by maintenance men. RED-D-PRENE assures long wear, reduces maintenance costs. Means positive identification in your stockroom. Ideal for heavy duty use in Mill and Plant installations.



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Maximum flexibility, moisture resistant.



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Write today for new descriptive brochure and samples.

DIAMOND WIRE & CABLE CO.

SYCAMORE, ILLINOIS

INSIDE NSC

Activities and people at 425 North Michigan

By Fred Lubet, Director, Membership Extension

NSC Alumni

The Council does a pretty good job of holding on to its people. Considering the size of the organization (fewer than 400 employees) there is a surprising number of employees (23 at last count) who tell the time of day by their 25-year gold watches.

But no organization can hold on to all its people. Some who come to work, after a certain time, seek greater opportunity elsewhere, or are enticed away by organizations who are taken with the individual's training, capabilities, and personal attributes. The Council has lost its share of its professional staff in these ways . . . perhaps more than its share, since Council staff people get to travel around a lot, meet a lot of people, and are in a type of work that makes them quite valuable to a large number of organizations, especially insurance companies, trade associations, and educational organizations.

Here's a list, by no means complete, of former NSC employees now with other organizations. (We've stuck with Industrial Department employees pretty much, and further limited the listing to former employees who were in Council employment long enough to become pretty well known in the industrial safety field.)

Robert H. Ferguson, assistant director of industrial relations, Republic Steel Corp. Formerly engineer in NSC Industrial Department.

W. Dean Keefer, second vice president, Lumberman's Mutual Casualty Company. Formerly director of the Council's Industrial Division.

Robert L. Moore, director, Technical & Engineering Division, Lumberman's Mutual Casualty Company. Formerly engineer in NSC Industrial Department.

Floyd Frazier, director of Industrial Division, National Association of Mutual Casualty Companies. Formerly engineer in NSC Industrial Department.

Clark Bridges, Council of Industrial Health, American Medical Association. Formerly industrial hygienist in NSC Industrial Department.

John M. Roche, chief of Safety Section, Chemical Corps Material Command. Formerly manager of NSC Industrial Department.

Robert Gidel, Bureau of Labor Standards, U. S. Department of Labor. Formerly senior consulting engineer, NSC.

Jasper B. Johnson, managing director, American Society of Safety Engineers. Formerly senior engineer, NSC Industrial Department.

E. P. Marconi, manager, Safety Branch, Aro, Inc. Formerly senior engineer, NSC Industrial Department.

Ray Ketchmark, Central District representative, Folding Paper Box Association. Formerly senior engineer, NSC Industrial Department.

William Davis, Safety & Industrial Hygiene Division, American Foundrymen's Society. Formerly senior engineer, NSC Industrial Department.

Harry Mathewson, assistant director, Institute of Transportation & Traffic Engineering, University of California. Formerly senior engineer, Industrial Department, NSC.

J. C. Stennett, manager, Accident & Fire Prevention, National Association of Mutual Casualty Companies. Formerly assistant manager, NSC Industrial Department.

Kent Francis, director of publications,



"I presume this policy also applies to flying carpets?"

Michigan Credit Union League. Formerly director of industrial publications, NSC.

E. R. Granniss, manager, Loss Prevention & Engineering Department, Royal Liverpool Insurance Corporation. Formerly senior engineer, NSC Industrial Department.

When you put them all down on paper, you get quite a list of well-known NSC Alumni. There's many a man here, of course, that the Council let go of with great reluctance and who left a gap in the operations that was hard to fill. But all the same there is solace in the fact that so many of "our boys" are placed well and are doing well. We feel this speaks well for the Council's selection policies and for the training which its people receive.

Air-Conditioning on Way

NSC headquarters—all 100,000 square feet—are going to be air-conditioned, by the middle of June of 1956.

With that fact established it can now be said that NSC headquarters are uncomfortably hot from June through September—and unbearably hot during those spells of 95° weather of which there has been an over-abundance these past few years.

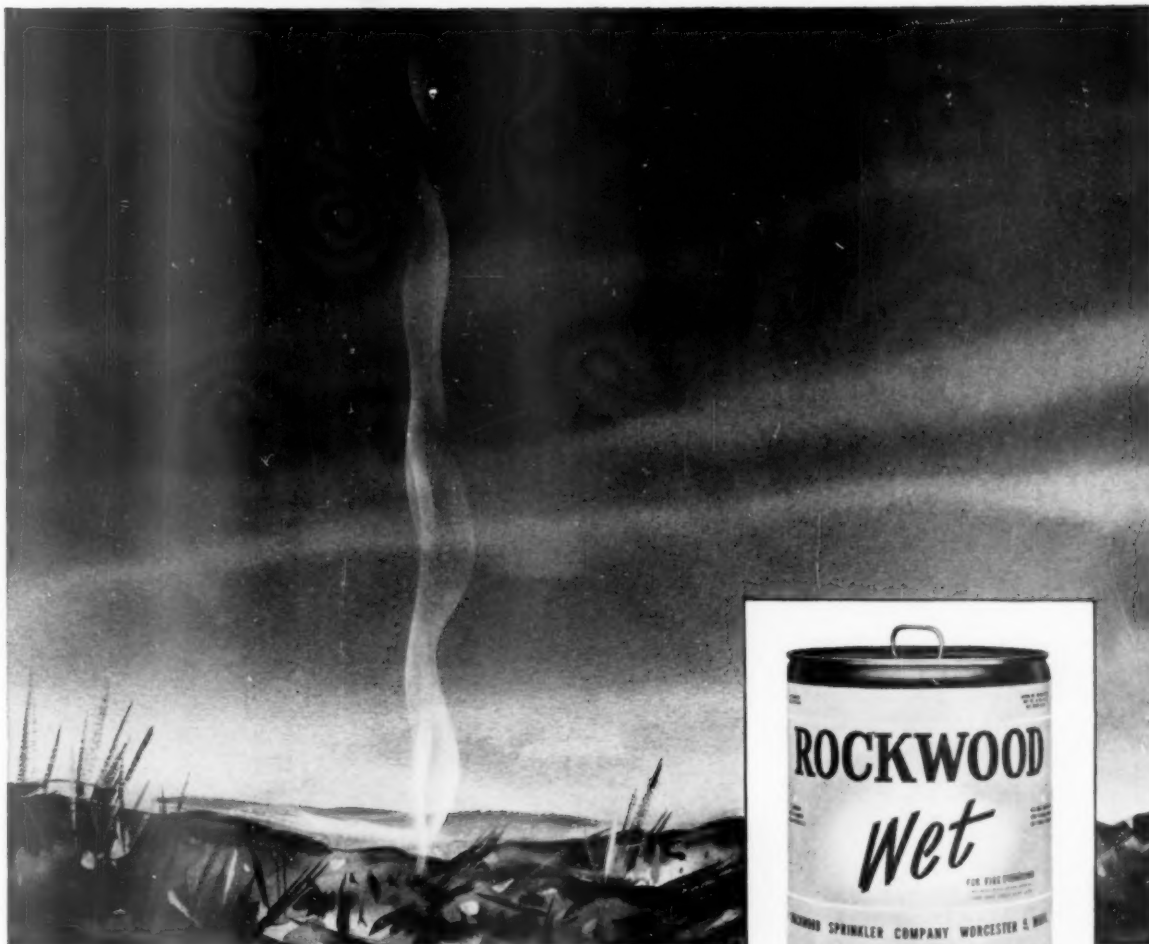
When NSC moved to its present quarters in 1950 the architects anticipated that summer ventilation was going to be a problem. Air-conditioning wasn't installed then, but the ventilating system was designed to permit air-conditioning at a later date.

The experience of the past few summers has convinced the Board of Directors that air-conditioning would pay for itself several times over, first, by reducing time and efficiency losses due to hot weather, and, second, by enabling the Council to compete more satisfactorily for general office help in the tight Chicago labor market.

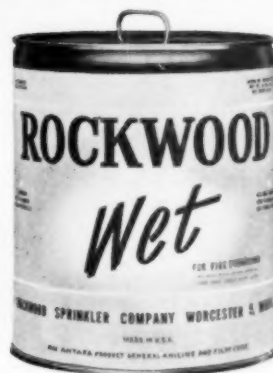
Here is a summary of the dollars and cents side of air-conditioning, as presented by NSC general manager General Stewart to the Board of Directors:

Total cost of air-conditioning (installation amortized over 14 years, plus additional electric power, and maintenance) is estimated at \$14,000 a year. Reduced

—To page 122



Rockwood Wet — a wetting liquid specially prepared for fighting deep-seated fires. Available in 50 gallon drums, 5 gallon and 1 gallon cans.



A fire fighter knows better

Water alone won't do it! The most effective way to fight this type of fire is to add Rockwood WET to the water.

It's the most effective way, because Rockwood WET increases the fire extinguishing action of water. The result is quick extinguishing, reduced rekindling—in less time... with less water!

The remarkable penetrating power of Rockwood WET reaches the very seat of the fire. And Rockwood WET retains its great depth of penetration even at fire temperatures. Tested and listed by Underwriters' Laboratories, Inc.,

Rockwood WET has proven its effectiveness against deep-seated fires in wood, paper, sawdust, cloth, rubber, etc.

You can use Rockwood WET in proportion of 1% for Class A fires and 2% for Class B fires. The Rockwood educator and proportioner is specially designed for this purpose. It automatically proportions liquids at any fixed percentage, from 1% through 6%.

Put this fire fighter to work for you! For complete details write today for Rockwood's free illustrated catalog. Distributors in all principal cities.

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Some Skins Are Sensitive

Most people can use any good soap safely. The others are a problem for employers, doctors and manufacturers

By WILLIAM LEIFER, M.D.

THE SKIN is not simply a large, flat, inert surface. It is a three dimensional, living organ performing functions vital to the health of the entire body. At the same time, the skin has its own devices to protect it and the deeper structures from the omnipresent noxious agents of the external world. Its horny keratin layer affords protection from mechanical noxae, and is providentially thickest where such protection is most essential, namely in the palms and soles.

Its network of sensory nerves warns us of the presence of potentially dangerous agents. Its pigment-forming cells elaborate a screen against the damaging effects of ultraviolet rays. Its sebaceous film protects against overwetting and overdrying, prevents the easy penetration of foreign substances, and in all likelihood is intimately concerned in the self-sterilizing capacity of the skin.

Finally, the normal, well-maintained acid state of the skin surface—its pH ranging between 4.0 and 6.0—buffers against the damaging effects of acids and alkalis.

The effects of soaps and other detergents upon the skin depend on a number of variables. The state of the skin itself is of prime importance. When the keratin layer is thin and when the sebaceous film is scant—as in young children and in elderly persons—

Dr. WILLIAM LEIFER is on the staff of New York University Post Graduate Medical School, New York. This article has been adapted from a paper read at the 25th Annual Safety Convention, Greater New York Safety Council.



To aid in the prevention of skin irritation soaps and detergents are frequently tested by users and by independent laboratories. Products are tested for irritating substances and to make sure they are readily removed from the skin with water. (Westinghouse photo)

soaps will more readily damage and inflame.

When the skin is already inflamed and its protective acid mantle impaired, soaps will serve as an additional irritant and damage further. Soaps that create a highly alkaline medium will more readily break down the buffering capacity of the skin and lead to inflammatory changes. The higher the concentration of the soap employed and the more prolonged its contact with the skin, the greater is the likelihood of adverse effect and resultant inflammatory changes in the skin.

Soaps and other detergents are essentially chemicals of low molecular weight. Many chemicals of this class are capable of inflaming the skin. They may do so by one of two mechanisms, either

by primary irritation or by the induction of an allergic state.

In the case of primary irritation, the initial contact with the chemical may result in a dermatitis. There is no need for an incubation period and the presumptive development of antibodies, as in the allergic state. Moreover, a chemical that can produce primary irritation dermatitis usually can do so in a high percentage of individuals exposed to an adequate concentration for a sufficient period of time.


As regards soap, it is probable that all persons will react with inflammation if soap is applied to the skin under a covered dressing for 24 to 48 hours. It is not, therefore, surprising that the commonest site for the onset of soap der-

—To page 126

LOWERY *Slings*

LEAD THE FIELD IN SAFETY AND PERFORMANCE

Here's proof you can see
IN A SLING YOU CAN TRUST



This is an actual untouched photograph of Lowery Brothers Tapered swage fitting that is used on Lowery Brothers slings to allow free passage under and around a load to be hoisted.

It is practically impossible to hook or snag this swage fitting on anything. This is due to the exclusive taper on both ends of the swage fitting.

By using Lowery Brothers swaged slings you are eliminating the hazards of hand punctures and scratches due to the fact that the hazards are covered with our swage fitting. This allows your workmen to handle the sling freely without worrying about their hands being injured.

Why you should use a wire core sling for economy and for strength:

Wire rope slings made from 6 x 19 or 6 x 37 wire core will give approximately 7% additional strength to the sling. As you know, hemp core is actually a filler and lubricator, but so is the wire core . . . and wire core will hold its shape and will not crush nor break. The bearing point is where slings usually flatten. The hemp core gives way and protrudes from between the strands. Then the strands separate and loosen and only three strands will take all the wear, thus shortening the service of your slings.

WIRE ROPE AND LOWERY SWAGE FORM SOLID STEEL MASS OF MAXIMUM STRENGTH

Examine the cut below, showing a Lowery Brothers swage loop or eye that has been cut into. You will note the solid mass of steel. The wire core also is in the swage, assuring you of the finest sling you can buy at any price. So get the best . . . get Lowery Brothers slings.



Your inquiries are welcome. All orders shipped within twenty four hours from our plant nearest to you.

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*National Safety Council
awards for outstanding records*

THREE TYPES of awards are given by the National Safety Council to industrial units in recognition of outstanding performance in accident prevention:

1. THE AWARD OF HONOR is available to units whose records, though not perfect, meet rigorous standards of excellence. These standards take into account the previous experience of the unit as well as the experience of the industry in which it operates. A unit must qualify on both frequency rate and severity rate. The Award of Honor is available also to units which complete 3,000,000 man-hours without a disabling injury.

2. THE AWARD OF MERIT has similar, but less exacting requirements. Minimum number of injury-free man-hours needed to qualify is 1,000,000.

3. THE CERTIFICATE OF COMMENDATION is available only for injury-free records covering a period of one or more full calendar years and totaling 200,000 to 1,000,000 man-hours.

Details of eligibility requirements may be obtained by writing to the Statistics Division, National Safety Council.



AWARDS OF HONOR

AiResearch Manufacturing Co.,
Los Angeles.

Celanese Corp. of America, Newark Plant, Plastics Div., Charlotte, N. C.

Ford Motor Co., Four awards: Fairfax-Sharonville Plant; Glass Plant, Dearborn, Mich.; Mahwah Assembly Plant; Tractor Plant, Highland Park, Mich.

General Electric Co., Hanford Atomic Products Operation, Richland, Wash.

General Petroleum Corp., Natural Gasoline Dept., Los Angeles.

National Distillers Products Corp., Old Crow Distillery, Frankfort, Ky.

Radio Corp. of America, Indianapolis Plants.

Sharp & Dohme, Philadelphia (Div. of Merck & Co., Inc.), Entire company.

Sylvania Electric Products, Inc., General Office, Salem, Mass.

The Texas Co., Two awards: Eagle Point Works, Westville, N. J.; Lockport, Ill., Div.

U. S. Rubber Co., Winnsboro (S. C.) Mills.



Fort Benning's 25,000 drivers are more safety conscious because of this National Safety Council banner flying at the main entrance to the Georgia Army post. The Infantry Center won the award for the third consecutive year in 1955. The banner is flown at half-mast for seven days whenever there is an accidental death.

Western Electric Co., Two awards: Hawthorne Works, Chicago; Indianapolis Works.

AWARDS OF MERIT

Allegheny Ludlum Steel Corp., West Leechburg (Pa.) Plant No. 4.

Allied Chemical & Dye Corp., Nitrogen Div., Omaha Plant.

Aluminum Co. of America, Fabricating Div., Massena, N. Y.

American Can Co., Englewood Plant No. 68-A, Chicago.

American Radiator & Standard Sanitary Corp., San Pablo (Calif.) Plant.

Arvin Industries, Inc., Electrical Appliances Div., Columbus, Ind.

Celanese Corp. of America, Mexicana-Zacapy Plant.

Chicago (Ill.) Carton Co., Entire company.

Consolidated Paper Corp., Ltd., Laurentide Div., Quebec, Canada.

Ford Motor Co., Three awards: Chester (Pa.) Assembly Plant; General Parts Depot, Detroit; Tractor & Implement, Birmingham.

General Electric Co., Two awards: Jet Engine Dept., A.G.T. Div., Cincinnati; Schenectady (N.Y.) Plant.

General Mills, Inc., Buffalo Flour Mill.


The B. F. Goodrich Co., Plant No. 4, Akron.

Kaiser Aluminum & Chemical Corp., Baton Rouge Works.

Lane-Wells Co., Head Office, Manufacturing, Engineering & Research Dept., Los Angeles.

Mills Mill Saxon Plant, Spartanburg, S. C.

Panama Canal Co., Community Services Bureau, Balboa Heights, C. Z.



Lace-to-the-toe, brown elk leather work blucher (S-4130). Rivet reinforced. Leather-lined steel toe box. Rawhide laces. Oil-resistant sole and heel.

Rugged Elk Skin makes this all-weather Thom McAn a real heavy-duty safety shoe!

THIS rivet-reinforced Thom McAn takes foul weather and rough working conditions right in stride. In fact, it can be used in foundry work—one of the toughest jobs a man (or a shoe) can face.

The leather is brown elk. Supple. Durable. One of the finest grades of work leather available. The sole and heel are oil-resistant. And the strong, rot-resistant rawhide laces run from top to toe, giving ankles firm support for long hours of standing work.

Add to these specialized qualities Thom McAn's traditional fine craftsmanship. Careful stitching. Low money-saving prices. You'll see for yourself why Thom McAn's so good it's the best-selling shoe in all America!

SOLD TWO WAYS: 1. At Thom McAn Stores. **2.** Direct to your plant. Send today for details of our money-saving plant-sale plan and Thom McAn's 4-way employee purchase plan—plus descriptions of the Thom McAn Safety Shoe line. Write: Thom McAn Safety Division, 25 West 43rd Street, New York 36, N. Y.

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Thom McAn

SAFETY SHOES

A Division of the Melville Shoe Corporation

WIRE FROM WASHINGTON



By Harry N. Rosenfield
Washington Counsel, National Safety Council

AS THE SECOND SESSION of the 84th Congress convened, safety began to figure substantially in Presidential messages and in Congressional committee work.

President's Message. Several safety considerations were included in the President's message on the state of the union. Among the measures which he had recommended in the previous year but on which no action had been taken, the President specifically called attention to legislation for highway construction and for occupational safety.

The President said that "legislation to provide a modern, interstate highway system is even more urgent this year than last" for reasons which included "the personal safety . . . of the American people." The President did not renew the bond financing recommendation which was the bone of contention in the previous session of the Congress, but asked for "an adequate plan of financing" within "the bounds of sound fiscal management."

The President also said that "occupational safety still demands attention," and called particular attention to the need for "legislation to improve the Longshoreman's and Harbor Worker's Compensation Act."

Highways. Considerable Congressional interest has been exhibited, as a result of accident statistics, in the Federal Government "doing something" about the matter. S. Res. 156 (Smith, Me.) would authorize the Senate Labor and Public Welfare Committee to make an investigation and study to determine "what action can be taken by the Federal Government to promote the public welfare by increasing highway safety in the United States." In such investiga-

tion and study, the committee would be directed to give consideration to the following: (1) the need for federal assistance to state and local governments in enforcement of safety and speed requirements; (2) the advisability and practicability of uniform state and local safety and speed laws, and what steps should be taken by the Federal Government to promote the adoption of such uniform laws; (3) possible means of promoting highway safety in the manufacture of vehicles; and (4) educational programs to promote highway safety.

H. Res. 349 (Friedel) would create a Select Committee to investigate the causes for the increase of highway accidents, and the measures which should be taken to promote safety "by having manufacturers of all motor vehicles incorporate appropriate safety devices in motor vehicles of all descriptions." The resolution also would direct the committee to draft legislation authorizing an appropriate federal agency to exercise authority "to insure that within the limits of federal authority every practicable method is used to promote traffic safety."

Industrial Safety. The Interstate Commerce Commission announced that it was considering making its revised report form on railroad accidents confidential in order to obtain complete and factual answers and to prevent improper use of the data; it invited comments on its proposal of confidentiality.

The Interstate Commerce Commission also deferred until April 1, 1956 the effective date of its rules and instructions for the inspection and testing of multiple-unit locomotives.

The Atomic Energy Commission issued regulations for licensing

persons responsible for handling the controls of reactors and other nuclear facilities in the civilian atomic energy industry. (For earlier comments, see "Wire," August 1955). Among other requirements that must be met is one that the applicant has learned to operate the controls "in a competent and safe manner." In the operating and written examinations, the operators must show an understanding and familiarity with safety mechanisms and safe operation.

The Bureau of Mines has embarked on studies dedicated to seeking ways to reduce air pollution from exhaust gases. In four air pollution research projects, undertaken in cooperation with the U. S. Public Health Service, the bureau will seek to find out (1) how different oils and motor fuels in motor vehicles affect air contamination; (2) ways to improve the design and methods of operating incinerators in order to curb air pollution; (3) methods for low-cost removal of industrial gases at furnaces and processing plants; and (4) analysis of industrial plant stock samples.

A staff study of the Senate Committee on Banking and Currency on federal disaster insurance, discusses air pollution and smog as "technological disasters," and outlines the current research projects of the United States Public Health Service to cope with the problem.

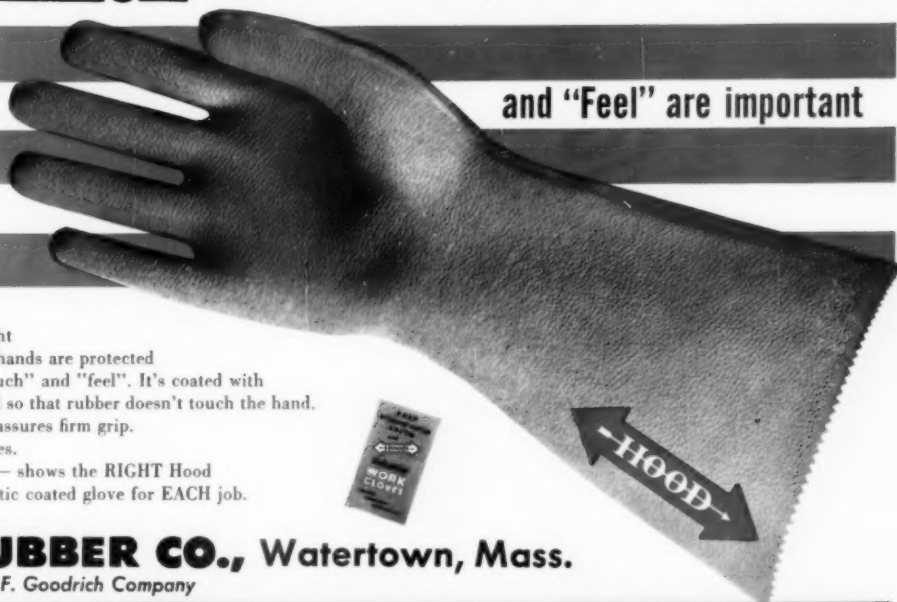
The International Labor Organization convened a group of experts to study international progress in the prevention and suppression of dust in mining, tunnelling and quarrying. The experts recommended: (1) greater international exchange of information on new types of anti-dust equipment; (2) that ILO prepare

—To page 135

HOOD Lightweight Industrial Gloves — For Jobs

where "Touch"

and "Feel" are important



No. 0009 gauntlet, for light industrial use. Working hands are protected but still sensitive to "touch" and "feel". It's coated with natural rubber; net-lined so that rubber doesn't touch the hand. A special rough surface assures firm grip. Small, medium, large sizes.

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There's more to salt tablets than meets the eye!

When ordering salt tablets for this summer remember, there are five distinct types of tablets and dozens of dispensers on the market. They are so highly specialized that there is a type of tablet and model of dispenser for virtually every need. For most effective results you must be certain to purchase the correct types for your plant.

The services of a highly trained StaSafe specialist is at your disposal, **without obligation**. He will bring to your office samples of all tablet variations and the more popular dispensers . . . discuss them with you . . . and give helpful suggestions on how you may better meet the torrid months to come.

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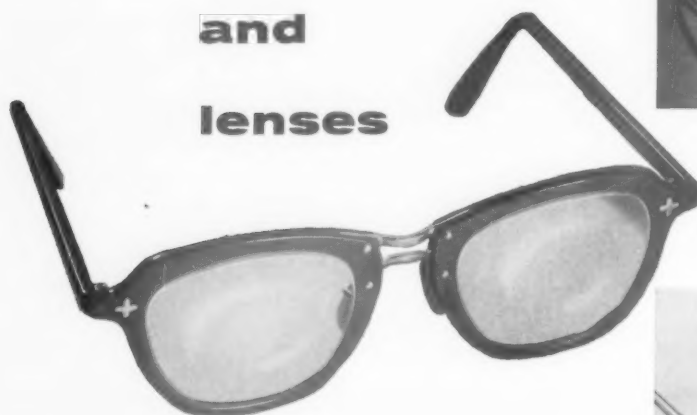
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of safety

frames

and

lenses



New Titan Metal-acetate combination

First combination frame in the industrial field. New S-7 lens shape for greater visual efficiency, increased protection, and better appearance.

Whatever your need for spectacle-type safety eyewear . . . Bausch & Lomb has a model specially designed to give you the utmost in worker protection, efficiency and comfort. Write for "Complete Eye Protection," valuable data on safety lenses, frames, and their application:
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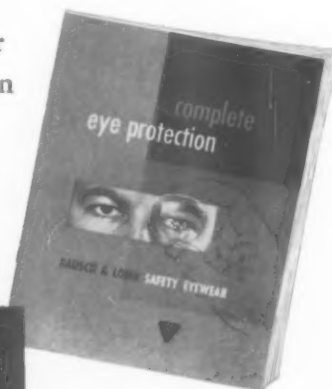
Popular all-metal type

Corrosion-resistant nickel alloy metal frame series, with P-3 "drop oval" lens shape. M-50 shown.



Favorite in all-acetate

Non-sparking, combustion-resistant acetate frame series, with P-3 "drop oval" lens shape. Y-70 shown.





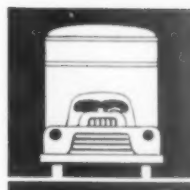
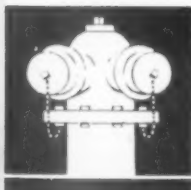
**TECHNICAL
FEATURE
SECTION**

The Journal

**OF THE
AMERICAN
SOCIETY
OF
SAFETY
ENGINEERS**

c o n t e n t s

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FEBRUARY 1956

As this first issue of the Journal section goes to press, all of us here at the Society headquarters are breathing a sigh of relief. The Journal has been a long time in the planning, and we've built up a lot of tension trying to make it as useful as possible. Of course, we hope to continue planning, and changing, to make future issues of the Journal better. We would like to have your comments to help in this process. But we want to point out, too, that this issue contains quite a variety of material that we hope will interest you. Our Society president's message on page one outlines the editorial policy of our new publishing venture, and on page five our managing director has prepared a story on the Society's progress. Page two features an article on grounding of electrical equipment, and on page seven we have a method for making fuel cells safe. Fleet operators will be especially interested in the page thirteen story on accident control in trucking. And we want to call particular attention to Dr. Irving Hartmann's page nine technical report on explosibility of American coals.—The Editor.

AMERICAN SOCIETY OF SAFETY ENGINEERS

Organized 1911 — Chartered 1915

425 North Michigan Avenue • Chicago 11, Illinois

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Electrician inspects ground connection in



our president speaks on safety

The publication of this first issue of the Journal of the American Society of Safety Engineers is an important step in the development and growth of the Society. It is a mark of progress of which all members of the Society can be proud.

The Journal will mean a great deal to the Society in terms of the prestige our publication will bring to the Society and its members, and to the safety engineering profession.

But even more important will be the service it can perform for our profession. Through the publication of this Journal, we can give safety engineers and others information that will help them do a better job in the prevention of accidents, inspire others to enter the profession, interest management officials to apply safety engineering more effectively in their business operations, and better enable safety engineers and management to cope with the ever-increasing technical complexity of hazards in the industrial community. The attainment of these purposes will justify the birth of this Journal.

Naturally, all of these aims cannot be implemented by any one issue. Later, as we look back over the total material presented through the years, we expect to see that in all these areas our Journal is making a substantial contribution.

Through technical articles, we will make available to our readers some of the new knowledge in safety which is being developed constantly through research and on-the-job experience. The pages of the Journal will carry discussions of safety philosophy, and present opposing opinions on controversial issues, expressed by men of prominence in safety engineering and other professions, in an effort to stimulate discussion of these issues and encourage the investigation and research through which they may be resolved.

This, then, is the cornerstone upon which this Journal has been founded. With time we hope to see it grow in size, in readership, and in its service to safety and to humanity.

Edward B. Landry

EDWARD B. LANDRY, PRESIDENT
AMERICAN SOCIETY OF SAFETY ENGINEERS



Electrician inspects ground connection in starter of 440 volt portable man cooling fan.

GROUNDING EQUIPMENT IN INDUSTRY

by R. J. Beeswy



EACH year statistics show that personnel in industrial plants are seriously and fatally injured as the direct or indirect result of inadequate grounding of electrical equipment.

American industry is growing rapidly. Must electrical injuries and fatalities due to inadequate grounding keep pace with industrial expansion?

All companies should give this question attention. And every effort should be made to decrease the present number of injuries and deaths from this cause.

At the Inland Steel Company proper grounding of electrical equipment is an important part of the overall safety program, and is the responsibility of the electrical department. Some of the procedures adopted for grounding equipment have proven themselves over the years and are presented in the following paragraphs so that some helpful information might be passed on to promote greater safety to both personnel and equipment in other plants.

Structural Grounding Networks

The main ingredient of a good equipment grounding system is the establishment of an effective grounding network between building structures and the non-current carrying parts of various equipment. Due to the fact that many of Inland's buildings are of metallic construction, lightning, or contact with an accidental grounded unit could create a voltage dangerous to human lives. To accomplish adequate protection a grounding network is established by driving several ground rods and connecting them to building columns with 1,000,000 CM cables. This practice in turn permits suitable grounding of electrical equipment to building frames.

At our new Open Hearth shops a very effective grounding network was established. 1,000,000 CM cables were brazed at 46 different points to building pilings, which were driven to a depth required for a solid footing. The ground cables were then bolted to the pilings and building columns. Where the cables are below grade, they are embedded in concrete for protection. This combination had a resistance to ground of less than one-third ohm.

Brick buildings and stacks are provided with a lightning rod system. This arrangement consists of several rods, known as "air terminals," extending above the height of the structure and interconnected to one or more suitable driven ground rods. Connecting cables between the air terminals and the ground rods are known as "down-comers," and are usually of 4/0 stranded wire. More than one down-comer is installed to insure protection in case one cable may become discontinuous. These

Most grounds are bare copper conductors, left exposed for visual inspection of continuity.

Will Accidents Caused by Inadequate Grounding Keep Pace with Rapid Growth of American Industry?

systems are periodically inspected with the aid of binoculars.

Power and Substations

Adequate and permanent ground for power and substations is guaranteed by connecting to the nearest large water main with bare 1,000,000 CM, stranded, copper cable. This cable is circulated through the earth for such a distance as to make it a good ground, even without the water pipe connection. The ground cable is connected to the building frame in several locations, and from this cable is extended a ground bus of one-quarter inch by four inch copper stock for easy connection by all ground cables at switchgear locations.

Ground cables are connected to instrument transformer secondaries, corona shields, switchgear frames and covers, transformer frames, motor and generator bases, lightning arrestors, rheostat frames, switch boxes and other equipment that might be charged electrically in any manner. Grounding corona shields of high voltage requires skill in making the stress cones at the shield termination. The practice at Inland has been to ground the shield at only one end.

Most of the grounding is done with a bare copper conductor, round or flat braid, and is usually left exposed where a visual inspection can determine its continuity. The sizes of grounding conductors are taken from the National Electric Code, which covers this matter very thoroughly.

At the various motor rooms, just as at the substations, a ground system is provided to ground all electrical equipment that is deemed necessary.

Auxiliary Equipment

As in the case in many plants, auxiliary equipment at Inland Steel is operated at many voltages—440 volt, three phase, 25 cycle is one of the more common. Every motor, control cabinet, starter, conduit and controller even though mounted on a metal base or panel, is grounded just as thoroughly as high voltage substation equipment. Where possible, ground connections are made visible so that an easy, quick continuity check can be made periodically. Control circuits for 440 volt equipment are specified to be 110 volt to reduce the hazard to operating people. Sometimes in areas limited to electrical maintenance personnel, 440 volt control is used. Here, however, rubber matting insulates the person who could make contact to ground, while servicing the equipment.

Another voltage used extensively throughout the plant is 250 volt D. C. Numerous 250 volt sources of power, each supplying its own system, are located throughout the plant. These systems are not grounded intentionally, but occasionally grounds, resulting from insulation failures, do exist. A continuing check is made of equipment to

eliminate these unintentional grounds. This is necessary because a ground in the control circuit can unexpectedly start a machine. As a further protection, both sides of the line are sometimes interrupted with the controller instead of the conventional one side. This is done for example on blast furnace skip hoist control circuits.

Ground detectors in the form of indicating lights or meters are used on all systems. Better insulations, proper installations and good maintenance have reduced the number of grounds considerably over past years.

Portable and Office Equipment

When operated from a 250 volt D. C. source, portable equipment is provided with a ground wire attached to the building frame or some other suitable ground. Periodically, a qualified electrician inspects the equipment for a possible insulation failure. Portable tools operating at 110 volts are not grounded unless employed in a hazardous atmosphere or location. Movable man-cooling fans which are operated on 440 volt, three phase systems have been one of the biggest problems in maintaining suitable ground connections. These fans, consisting of a 3 H. P. motor mounted on a vertical stand, which is sometimes mounted on wheels for easy movement, weigh about 200 pounds. The fans are moved about at the disposal of operating personnel to places where they are desired. Because the flexible electrical cables are exposed to weather, heat, moisture and severance by human actions, a suitable exposed ground wire is hard to maintain. A braid was twisted around the three conductor cable, but sooner or later several feet of it was missing to be used as a radio antennae, or some other purpose. Flat linked chains were tried as an external ground, but when the tension was taken off they no longer made good continuity due to the separation of the links. A No. 12 wire, four conductor, cotton braided cable with rubber insulated leads surrounded by a .010 inch tinned copper braid has been adopted as standard. The one No. 12 wire to be used as a ground is marked with a white braid. The ground conductor and copper braid are connected to a metal part of the man-cooling fan and at the switch to a grounded terminal provided for it.

Most office equipment, such as typewriters and computing machines, are grounded whenever they are operated near a radiator, water pipe or other grounding



R. J. Beeswey heads the Electrical Department, Indiana Harbor Works, Inland Steel, where he has been in electrical work for 38 years. His article is based on a paper he presented at the 1953 National Safety Congress.

medium with which the operator might come in contact. Other equipment, such as water coolers and air conditioning units, always have the frames grounded.

With the 250 volt D. C. office equipment as well as some of the newer 110 volt systems for office service outlets, a three prong, polarized plug is employed with the third wire used to ground the frame. Special sockets and plugs have been adopted for all low voltage service outlets to prevent injury which could occur due to plugging into a higher voltage than that for which the apparatus or appliance was designed. Also, as an added safety measure, the outlets are stenciled so that a visual check can determine the voltage.

Lighting

Practically all plant lighting is 230 volts A. C. or D. C. Switches, transformers and all metal housing for electrical equipment are grounded. Office lighting is primarily 208/120 volts, 25 cycle, and operates with the grounded neutral. Some office lighting is being converted to 110 volt, 60 cycle, fluorescent fixtures. This 60 cycle system operates with a grounded neutral similar to home installations, unless fed from a small isolated motor-generator set, which may or may not have one line grounded.

Also, throughout the plant a special form of low voltage lighting is provided for personnel working inside or near metal enclosures, in vaporous atmospheres, or in areas where it is necessary to stand in water. Portable transformers supply 12 volts for as many as five 50 watt lamps. These 250 watt transformers are supplied from a 230 volt, 25 cycle source. All plugs and sockets for the 230 volt and 12 volt connections are of a selected type so that plugging into a higher voltage is not possible.

Hazardous Locations

Special care is taken to prevent explosions due to dynamic or static voltages in areas where explosive atmospheres exist due to flammable liquids. In the coke plant's benzol and naphthalene buildings and yards, 32 two-inch pipes are jetted into the earth to a depth of 20 feet. Inside of each is placed a three-quarter inch pipe containing a 4/0 trolley wire. The excess space is filled with coke breeze and periodically wet down to maintain a good ground. The 32 ground connections are joined together to form a network, and then ground wires are tapped onto this system.

Periodically, these ground rods are checked by measurements to prove their effectiveness. One at a time, a lead going to one ground rod is removed and the resistance between it and the remaining ground network is measured. If a discrepancy is noted, repairs are made or a new rod is driven to replace the old one.

All tanks, pipes, metallic insulation mesh for tanks and pipes, motors, switches, conduit, fixtures, metal frames and supports are grounded. No metal banding of pipes is allowed, and no metallic paints are used due to the capacitive effect created. Benzol plant railroad tracks are insulated from the rest of the plant system, and are bonded and grounded. All pipe flanges have copper shunts around them. Electrical equipment is of the explosion or vaporproof type, but is being rapidly converted to all explosion proof equipment. Only non-sparking

repair tools are used, and these are equipped with static proof parts. Also special Bureau of Mines approved flashlights are provided in an effort to eliminate every possible spark which could cause an explosion.

Electrostatic Grounding

Electrostatic charges developed due to rotating, rolling, or sliding equipment can sometimes be dangerous and destructive, as well as a nuisance. Care is taken to provide ground connections on metal frames of large rotating, non-electrical equipment, such as pumps and blowers. Static charges on conveying belts are removed by grounded metallic idler rolls or grounded contact brushes, where required. This is especially true in explosive atmospheres.

In dealing with high voltage precipitator equipment for cleaning blast furnace gas or removing coke plant tar residue for by-product purposes, special attention is given to grounding all adjacent metallic parts. The 75,000 volt equipment is enclosed, and electrical interlocking is provided to prevent entrance without first shutting down the high voltage rectifiers. Also to obtain entrance to the rectifier units, the necessary key can be obtained only by first shutting down the rectifier. The key is so placed as to make this mandatory. As an additional safety measure, a grounded probing cable or chain with an insulated handle is provided to discharge any cumulated electrostatic charge on the high voltage equipment, before attempting to service it. As on the high voltage precipitator equipment, electrical interlocking is provided on X-ray machines in both mills and plant hospitals. This interlocking and the fact that only qualified technicians may gain entrance by key eliminate high voltage and radiation hazards.

Maintenance

Periodically, ground rods are checked to insure that grounding networks are of minimum resistance. A portable ground resistance meter is employed to determine the resistance. The meter has a movement which measures the drop in potential between the measured ground rod and a test ground rod, and the current created by the instrument, which flows through the measured rod and a second test rod. By using two test rods, the measurements are independent of the ground resistance of these rods. The effects of stray currents are also eliminated by designed features of the meter.

Grounding wires from equipment to the networks are installed for ease of observation by electrical maintenance personnel. When a loose connection or a broken wire is discovered, repairs are affected immediately.

Training of Personnel

To insure that maintenance personnel are vigilant to locate faulty grounding connections, the why's, where's and how's of adequate grounding are periodically reviewed during training sessions and safety meetings. Demonstration devices have been constructed to visually show the consequence of inadequate grounding. It is hoped that on-the-job training will be utilized by personnel not only at the plant, but at their outside activities to curb electrical injuries and fatalities in the home.



AMERICAN SOCIETY OF SAFETY ENGINEERS: MILESTONES

by J. B. Johnson, Managing Director of the Society

THE history of industrial development in America is a thrilling story of many chapters, not the least of which are those dramatic pages contributed by the safety movement.

Safety has had, and still has, its struggles against inertia and ignorance. It continues to adventure in research, finding new and safer methods and machines. And what greater drama could there be than the devotion of man to man that has been the inspiration and strength of the safety movement.

Many great organizations and many great men have earned prominent places in the annals of safety. Members of the American Society of Safety Engineers can be proud that their Society is one which has been an integral part of this exciting movement.

Today, the Society is stronger and more active than ever before in its history. Its membership of more than 6,500 is spread throughout the world, with 61 chapters in the United States, Canada and Hawaii.

There are other evidences of expansion, too, such as the Society's publication for members, *Engineering for Safety*, which has grown from a one sheet mimeographed letter to a printed monthly news magazine. The most recent milestone in the Society's progress is this first issue of our *Journal*.

The Society indeed has come a long way since its beginning in October, 1911, when 35 men got together

in New York City to form the United Association of Casualty Inspectors with the avowed objective "to promote the social and educational advancement of its members in the prevention of industrial accidents."

Only a few years previously workmen's compensation legislation had first been proposed in America. In the words of the late A. D. Caddell, former managing director of the Society, it was a time when "mounting public opinion demanded action to control the needless waste caused by industrial accidents. The magnitude of the problem, even at the then comparatively low industrial levels, indicated the need for exchange of thought and experience, to cope with the increasing totals of injuries."

Apparently the new organization helped to meet this need, for it grew and prospered. In May, 1914, a name more descriptive of the objectives of the group was adopted—the American Society of Safety Engineers. The first meeting under this new name was held in New York City on December 6, 1914, and in 1915 the Society was incorporated in New York State as a corporation not-for-profit. The original charter, which is reproduced at the beginning of this article, has been in force continuously since 1915.

There was duplication in the efforts of the Society and the National Safety Council and in 1924, after long consideration, the Society became an organic part of the Council as the American Society of Safety Engineers—

AMERICAN SOCIETY OF SAFETY ENGINEERS

PAST PRESIDENTS and CHAIRMEN

1911	J. E. Anderson	1933	S. E. Whiting
1912	J. G. Shaw	1934	A. S. Regula
1913	A. A. Frazee	1935	C. W. Smith
1914	E. D. Haggerty	1936	D. L. Royer
1915	W. E. Welch	1937	C. B. Boulet
1916	H. H. Dehn	1938	R. E. Donovan
1917	C. Van Horn	1939	F. W. Braun
1918	C. Van Horn	1940	F. W. Braun
1919	H. W. Mowery	1941	H. J. Griffith
1920	H. W. Mowery	1942	Wills MacLachlan
1921	G. E. Sanford	1943	H. R. Bixler
1922	C. O. Smith	1944	W. D. Keefer
1923	W. J. Venning	1945	W. D. Keefer
1924	A. J. Van Brunt	1946	R. M. Godwin
1924	A. D. Risteen	1947	J. S. Shaw
1925	G. E. Sanford	1948	R. H. Ferguson
1926	E. W. Beck	1949	E. C. McFadden
1927	R. McA. Keown	1950	W. P. Yant
1928	J. I. Banash	1951	J. C. Stennett
1929	C. B. Auel	1952	C. H. Weiser
1930	R. F. Thalner	1953	W. F. Brown
1931	M. G. Lloyd	1954	W. N. Cox Jr.
1932	H. S. Smith		

HONORARY MEMBERS

1946	John Roach	1953	John J. V. Forbes
1947	Daniel Harrington	1953	John Stilwell
1948	Ned H. Dearborn	1954	Clarence H. Weiser
1953	James I. Banash	1954	Sidney J. Williams
1953	W. H. Cameron Sr.	1954	William P. Yant

Engineering Section, National Safety Council.

The relationship as the Engineering Section of the National Safety Council was maintained for 23 years, until October 7, 1947, at which time the membership of the Society voted to reestablish the Society as an independent organization.

Just what is the Society today? Perhaps the best answer can be found in its stated objectives and in some of the activities with which it implements them. The Constitution of the Society now contains a broader statement of objectives than was conceived in 1911. Originally concerned only with the social contact and educational advancement of its own members, the Society has since expanded its concept to make available to everyone the engineering principles developed within the group.

As set forth in the Constitution, the objectives of the Society are

- (1) to promote the arts and sciences connected with engineering in its relation to accident prevention and the conservation of life and property;
- (2) to attain a high standard in safety engineering;
- (3) to encourage the development of safety engineering as a profession.

Of course the measure of any organization such as the American Society of Safety Engineers must be taken, in the final analysis, in the light of specific activities which bear out the high-minded aims expressed. And in this respect the Society has not fallen short.

To cover fully only one activity from the Society's history of service to the safety engineering profession—

the development of technical data for the solution of engineering and other problems—would require more space than can be devoted to this entire article. The Society, through its Committee on Technical Publications, has long cooperated closely with the National Safety Council in the preparation of Safe Practices Pamphlets and Industrial Data Sheets. And this work continues today as Industrial Data Sheets constantly are written and reviewed by the Society.

Another recent activity has been the publication of a revised edition of the outline, "Industrial Safety for Engineering Students—A Suggested Engineering College Course." The course, a project of the Committee on Cooperation with Engineering Colleges, is designed to help bring a sound understanding of basic safety principles to all engineers.

The Society's Committee on Safety Standards has worked closely with the American Standards Association in seeing that the Society is represented on every important AAA Safety Code Committee.

To mention only the names of a few other Society committees will give an idea of the scope of this virile program for safety—the Committee on Cooperation with Engineering Societies, which carries on liaison in accident prevention activities; the Committee on General Publications, which aids in presenting current news and technical developments to the membership; the Committee on Improved Membership Services, which initiates material to meet the needs of Society members for assistance from the national level; the Committee on Membership, which safeguards membership standards; the Committee on Chapters, which evaluates chapter performance; the Committee on Public Relations, which increases the prestige and usefulness of the safety engineer and the Society through promotional projects; the Committee on Research, which seeks out and helps direct needed studies to add to the fund of safety knowledge; the Committee on Safety Laws and Regulations, which keeps the membership informed of pending and newly passed legislation of interest to safety engineers; the Committee on the Study of Traffic Safety, which keeps abreast of developments and assists recognized traffic groups in the solution of problems in this vital field of safety; the Committee on Finance, which maintains our sound fiscal policy.

And no list of Society committees can be completed without a mention of the Committee on Awards and Honors, which guides the Society's Albert D. Caddell Chapter Achievement Award Program. The awards—one grand award and five regional awards—are presented annually to chapters which lead in activities of benefit to the Society, the profession and the community.

Through reports submitted for this awards program can be seen the tremendous volume and variety of activity that chapters of the Society undertake in the collection and dissemination of technical material and in participation in civic service projects such as school plant inspections, junior achievement, traffic safety programs, scholarship awards, consultation service for small industries, educational radio and television broadcasts.

This, then, is a brief picture of the American Society of Safety Engineers—its history, aims and accomplishments. The publication of this Journal is another milestone in the history of an organization which will continue to advance in serving humanity as a contributing partner in America's safety movement.

Air Held Superior To Inert Gas in Creating Gasoline-Free Atmosphere

by Fred R. Temple

MAKING it safe for men to work inside and around the largest airplane gasoline tanks in the world is one of the most important jobs of safety engineers at the Fort Worth plant of Convair Division of General Dynamics Corporation.

Shortly after Convair began building the record-breaking 10-engine B-36 bombers, it became evident that procedures would be needed for servicing and maintaining them. Work on the fuel cells (inside the 230-foot wing) would be the most dangerous of all—especially so since the aircraft uses only the highest octane military-type gasoline.

When an airplane required work, our problem was this: to empty the fuel cells and dry them out to give us a safe, gasoline-free atmosphere. This was necessary because employees (two or more per tank) had to work inside the tank to find and make the needed repairs. An employee in a tank containing a flammable atmosphere posed a constant hazard both to the employee, the aircraft, and other employees in the vicinity of the dangerous tank.

Much of the work was of very tedious nature involving (1) finger dexterity, (2) use of small hand tools, and (3) good eyesight. So it was not advisable to burden the employee with bulky protective equipment. We also thought the employee himself would not like these working conditions. So we set out to develop a purging (gas free) procedure to make the tank safe and to maintain the best practical working conditions.

To begin with, we considered the various known methods of treating such a problem, and evaluated the advantages and disadvantages of each.

Using an inert gas such as carbon dioxide would give us (1) a cooling effect and create moisture inside fuel tanks, and (2) pose a hazard from static electrical charges in the usual methods of injection. Argon or nitrogen in the tank atmosphere would involve the same handling of bottled gases, as well as the expense of maintaining the inert atmosphere. Since the tank had to be dried out, the injection of inert gases seemed not to assist in solving the problem but would merely add another step to the operations necessary in the process.

In short, we concluded that we should use the thing which nature provided most freely: air.

The next question was whether to (1) inject the air into the atmosphere, or (2) by suction pull the atmosphere out of the tank and allow it to be replaced by non-hazardous air. To use air blowing into the tank would force hazardous atmosphere of the tank through various openings. There again the problem of creating

static charges on the turbulent vapor clouds inside the tank would be very hazardous and a source of explosion.

Thus, by elimination, evacuation of the tank atmosphere by low velocity, high volume exhausting seemed the safe answer. It had the advantages of (1) no inherent hazards, (2) a slight vacuum condition (reduced atmospheric pressure) which would accelerate air and a controlled outlet for the dangerous fuel vapor.

Through exhaust fans or blowers, this atmosphere (1) could be moved and discharged at virtually any safe point desired, (2) allowed us to use flash screens to prevent back flashes to the tank, (3) eliminated use of additional costly equipment, and (4) made possible the use of portable equipment for the job to avoid moving the airplane.

Our next problem was (1) determine the equipment, and (2) develop the procedure. In the initial stages, very simple, commercially available equipment in the form of a six-inch air mover attached to a one-inch 100-pound airline was used. This equipment proved satisfactory but was later replaced by specially designed equipment as shown in the photograph.

Our next problem involved drawing up the procedure. This procedure finally evolved:

1. Ground the airplane.
2. Bond the fuel draining equipment to the airplane and ground it to a common point with the airplane.
3. Drain the fuel tank by pump or gravity flow.
4. Pick up by vacuum pump the residual fuel which in shop terms is referred to as "depuddling."
5. Attach the vacuum air mover or blower equipment by first bonding it to the aircraft then attaching it to the tank opening (access door) in the spar.
6. Remove the fuel tank cap, assure the vent line is open, and drain and remove the booster pump.
7. Start the exhaust or vacuum which pulls air through the tank to dilute the fuel vapors and dry the tank.

This process is continued for the necessary period of time until the tank atmosphere, when left undisturbed for 30 minutes (exhaust stopped), shows by explosimeter test that it contains less than 15 per cent of the lower explosive limit of fuel vapor. When this point is reached equipment is removed, employees are allowed to enter the tanks and perform their work.

Normally some type of ventilation is utilized for the comfort of the workers during repair. Of course, during the work around the fueled aircraft, standard safety procedures in control of body static, grounding and bonding, explosive-proof lights and use of air tools are employed.

This equipment and procedure was used on hundreds



Fred Temple is supervisor of the Safety Engineering Section at Convair, a division of General Dynamics Corporation, Fort Worth, Tex. He is a member of the Society, and past general chairman of the Fort Worth Chapter.

of fuel tanks until the early part of 1951 when an employee placed a one-inch airline inside a fuel tank. Within seconds after the air pressure was turned on, the tank exploded. The explosion was probably set off by static changes from the high-pressure moisture-filled 100-pound air stream. At this time it was decided that special equipment would be designed and additional controls and safeguards be used for the gas freeing (purging) process.

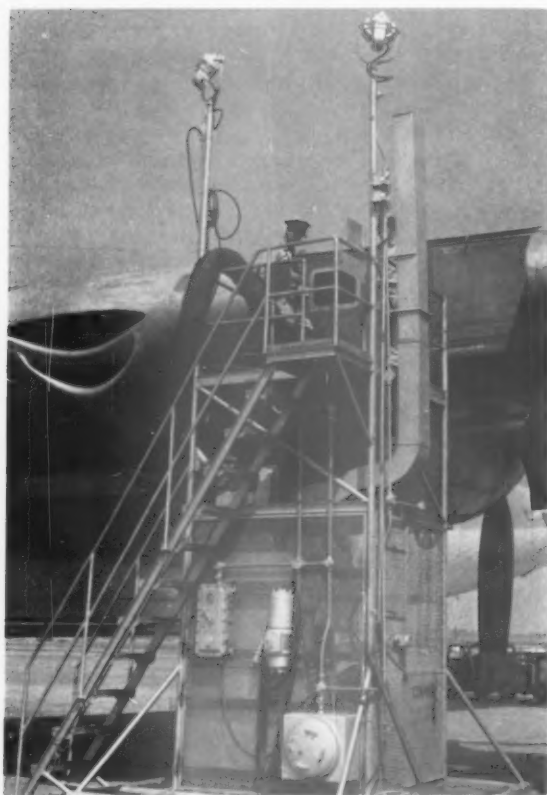
At the direction of management, the Safety Engineering Section led a group in setting up improved procedures, new equipment, isolation of the operation and the designating of a special crew adequately trained in safe procedures.

Valuable assistance and contributions were given by Convair plant engineering, electronics, engineering, industrial security, and industrial engineering people. The procedure was left virtually intact as previously set up. The group thinking was unanimous in that specially designed equipment with an adequately trained crew, briefed by the safety engineering group, was necessary to prevent possible recurrence of the explosion mentioned above.

It was also agreed that no other work which would pose possible source of ignition would be done during the gas freeing or fuel handling operations. Later a special station was allocated for this hazardous type of work.

The special equipment designed was a portable stand

Purging stand in use for fuel tank of B-36 at Convair. Man on platform is checking for gas-free atmosphere.



with a 2500 CFM exhaust fan equipped with an eight-inch flexible duct, explosion-proof electrical equipment and circuits; all electrically bonded and with provisions for grounding and bonding to the airplane. One such stand was provided for each of the six wing tanks of the B-36.

This equipment is adaptable and is being used for other types of aircraft, i.e., C-54. The exhaust duct is an electrically bonded metal duct equipped with a flash screen at the outlet which is high above the airplane and other possible sources of ignition. We have found that with the 2500 CFM blower on the largest B-36 fuel tanks, after some 5 to 12 minutes of suction, the atmosphere is diluted below the lower explosive limit and from then on the tank is perfectly safe until it is adequately dried out.

At one time the use of inert gas for injection prior to gas freeing a fuel tank was proposed. In the performance of an engineering test utilizing low pressure nitrogen for inerting, we found that the safest procedure was to start with a full fuel tank, replacing the fuel with nitrogen as the tank was drained. This involved (1) filling a partially full fuel tank, (2) additional equipment for the inerting with nitrogen in the exhaust process. In the exhaust process, the residual vapors from pockets of liquid fuel and the drying out of sealants was sufficient to change the tank atmosphere to slightly above the lower explosive limit in spite of the inerting gas. Probably this was occasioned by capacity of the exhausting fans being much greater than the volume of the injected nitrogen. The reduced flow of nitrogen gas to eliminate static charges limited the volume of the gas going into the tank. The complete process increased the elapsed time (hurting production schedules) necessary to gas free fuel tanks. After two such engineering tests, injection of inert gas was abandoned.

One of our basic principles in the handling of flammables is to keep the elapsed time at a minimum, as well as to eliminate all possible sources of ignition.

In this operation, we accept as almost inevitable the fact that two of the three legs of the fire triangle are ever present: (1) fuel vapors in a flammable range, and (2) sufficient oxygen to support burning. Thus eliminating the ignition sources (heat) becomes all important. And when elapsed time (exposure) is reduced, we reduce the chance of fires and explosion.

We have had one mishap in the gas free process of purging thousands of fuel tanks. The error in this mishap is pretty obvious, and should never have been done by our employee—nor anyone else. Our policy calls for gas freeing fuel tanks on all of B-36 aircraft going through our maintenance program, as well as other aircraft where shop operations involve the fuel tanks or require the use of conventional aircraft manufacturing equipment. This gas freeing (commonly called purging) of the fuel tanks allows us to perform safely many work operations with conventional tools, open type electrical equipment and in locations that would not otherwise be safe.

A hazardous fuel tank atmosphere would require much costly personal protective equipment, electrical equipment, and/or air tools not needed around the safe fuel tanks.

There is also another important value which we are not able to measure in time or money: the feeling of our employees that the company is making every effort to provide a safe place in which to work.

Explosibility OF AMERICAN COALS



Physicist Irving Hartmann is chief, Branch of Dust Explosions, Division of Explosives Technology, U. S. Bureau of Mines, Pittsburgh, Pa. This article is based on Bureau of Mines Report of Investigations Number 5052.

by Irving Hartmann, Ph.D.

THIS investigation was undertaken to obtain data on explosive characteristics of several ranks of coals. Need for this information arose as a result of current applications of pulverized coals in industry. These include pulverized-coal boilers, fluidized fuels, turbines for railroad locomotives, coal gasification, chars of low-rank coals, activated carbons, foundry facings, jet propulsion, synthetic liquid fuels, plastics, chemicals, etc. In some instances the coal dust is normally in suspension in air, in oxygen, in oxygen-deficient, in oxygen-rich, or in other special atmospheres; in other applications the dust is dormant, and no explosion hazard exists unless it is dispersed and ignited.

The coals were taken from seams in different parts of the country, ranging from lignite to meta-anthracite. Most studies were made on coal dusts which passed through a 200-mesh sieve (74-micron-square). Some experiments were conducted with so-called mine-size dusts, in which all particles were finer than 20-mesh (Tyler sieve scale), and 20 per cent by weight passed through a 200-mesh sieve.

In tests on the effects of particle size, samples composed of definite sieve fractions were used, that is, 48- to 65-, 65- to 100-, 100- to 150-, 150- to 200-, 200- to 270-, 270- to 325-, and through 325-mesh. In another set of experiments the effect of varying proportions of through-200-mesh particles in the samples was studied; the fine dust was added to coarse aggregates consisting of particles between 20- and 200-mesh.

To evaluate the effect of moisture on the explosibility of coal dust, experiments were made with bituminous Pittsburgh coal, to which various percentages of water had been added, and with a subbituminous coal (with an initial moisture of 11 per cent) that had been gradually dried so that it retained different amounts of moisture.

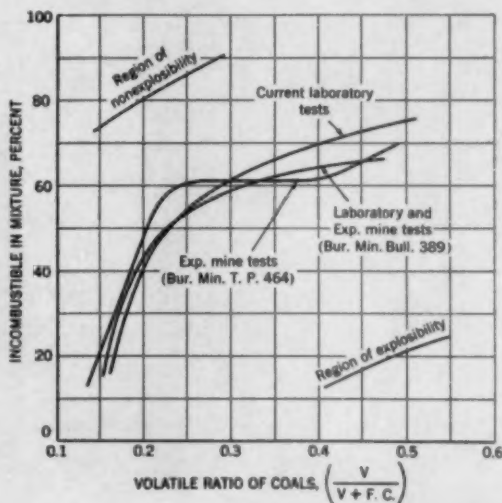
The test data represent relative rather than absolute values, since results depend to some degree on the size, shape, and other characteristics of the explosion vessels; uniformity of the dust clouds; exact particle-size distribution; intensity, size and duration of the ignition source, and other variables.

Most experiments were performed in air, but in many tests the dust was dispersed and ignited in oxygen. To determine the limiting percentage of oxygen that will support combustion, in a few tests mixtures of air and CO₂ were used; for Pittsburgh coal the limits were evaluated at different ambient temperatures.

Figure 1 shows the incombustible or rock-dust requirements for preventing flame propagation in dust clouds of various ranks of coals. The curve, based on current laboratory tests, on the whole indicates good correlation with results of earlier experiments on other samples in the laboratory and in the experimental coal mine. As can be seen, the incombustible requirement is less than 50 per cent for coal dusts of volatile ratios below 0.20, and the value becomes 65 per cent or more only at volatile ratios of about 0.30 to 0.35.

Figure 2 shows the effect of volatile content on the lower explosive limit, minimum igniting energy, and ignition temperatures of coal dusts. In air it was most difficult to ignite dust clouds of low-volatile bituminous coals and anthracite by electric sparks, and therefore their lower limits and minimum energies could not be determined; in oxygen, ignitions were readily obtained with all coal dusts. The curves show that the ignition sensitivity increases and the lower explosive limit decreases with increased volatile content. In oxygen this

Figure 1—Explosibility of mine-size coal dusts, based on tests in the experimental coal mine and in the laboratory.



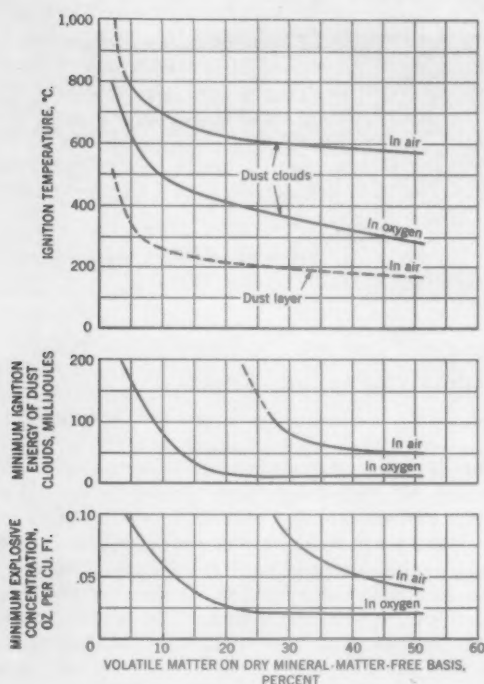


Figure 2—Minimum explosive concentration, minimum igniting energy and temperature of through-200-mesh coal dusts in air and in oxygen.

Figure 4—Relation of temperature to relative flammability and to limiting oxygen content in atmosphere for preventing ignition of dust clouds of bituminous Pittsburgh coal.

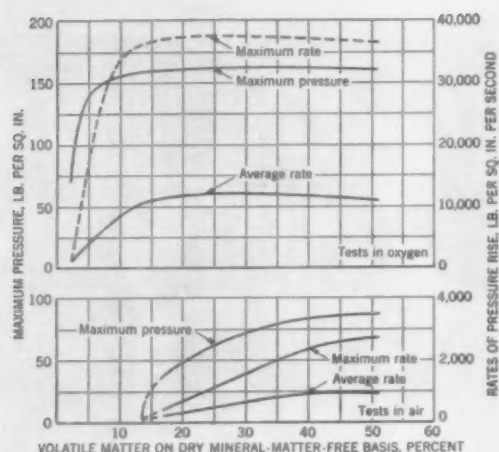
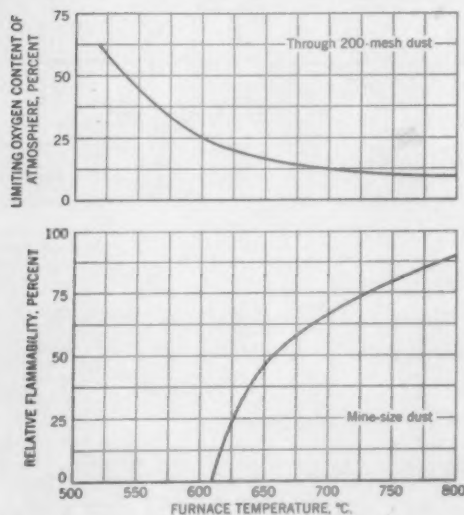


Figure 3—Maximum pressures and rates of pressure rise developed by explosions of 200-mesh dusts in air and in oxygen (dust concentration = 0.50 oz./cu. ft.).

effect becomes less important above a volatile content of about 20 per cent.

Figure 3 shows the effect of volatile content on the maximum pressures and rates of pressure rise developed by explosions of dust clouds in a closed bomb; rates above 15,000-20,000 lb. per square inch per second are approximations. The curves show that in air the pressure and speed of the explosions increase with increase in volatile matter, whereas in oxygen there is little change in intensity above 20 per cent volatile. This figure, as well as others, shows that the hazard of coal-dust ignitions and explosions in oxygen is several times as great as in air.

The maximum pressures and rates in the air tests were attained at (optimum) concentrations of 0.50 to 1.00 ounce per cubic foot, which is several times the stoichiometric composition. Explosion tests in oxygen could not be performed at concentrations above 1.00 ounce per cubic foot, the limit being set by the strength of the test equipment. None of the dusts tested attained peak pressures below this concentration.

The effect of initial pressure on explosions was studied with one bituminous coal dust. Pressure tests were made at concentrations ranging from 0.10 to 2.00 ounces per cubic foot (approximately 0.10 to 2.00 gm. per liter). It was found that, in all cases, the maximum explosion pressures and the rates of pressure rise increased linearly with the initial pressure. As an example, at initial pressures of 0, 10, and 20 p.s.i.g., the explosion pressures were determined to be 73, 99, and 125 p.s.i.; the average rates were 2,100, 2,700 and 3,350 p.s.i. per second; and the maximum rates were 4,300, 5,700, and 7,100 p.s.i. per second.

Increase in particle size reduces ignition sensitivity and pressure developed by explosions. Dust clouds of fractions of Pittsburgh bituminous coal coarser than 150- to 200-mesh could not be ignited in air by electric sparks.

In oxygen, on the other hand, ignitions and (mild) explosions were produced, even in dispersions of 28- to 35-mesh particles; the effect of particle-size increase is much less pronounced than in air.

The ignition temperature of dust clouds of Pittsburgh bituminous coal is fairly constant as the particle size increases to about 180 microns (65- to 100-mesh), being about 200° C. lower in oxygen (425° C.) than in air (610° C.); further increase in size results in rapid rise in the ignition temperature. The relative flammability, determined at a furnace temperature of about 700° C., decreases with increase in size of dust particles, as might be expected.

Addition of fine (through 200-mesh) dust particles, up to 30 to 40 per cent of the total (by weight) results in a very significant reduction in the minimum explosive concentration and the minimum igniting energy, and further increase has much lesser effect. The relative flammability of dust clouds increases almost linearly with increase in the proportion of fine particles.

The effect of moisture on explosibility of coal dust is important in some industrial processes and also under special mining conditions, with relation to rock-dust requirements. For fine Pittsburgh coal dust, there is little change in the lower explosive limit up to about 8 per cent moisture, but beyond that the required dust concentration increases sharply. The minimum igniting energy is 50-60 millijoules up to 4-5 per cent moisture and then increases rapidly. Data were also obtained on explosion pressures and rates of pressure rise of these samples. At several dust concentrations there appeared to be an increase in pressures and rates with increase in moisture content to 5 per cent and beyond that a fairly rapid decrease in the values. When similar tests were made with a subbituminous coal, dried to various percentages of moisture content, there was very little change in pressures and rates in the range of zero to about 8 per cent moisture content.

The effect of ambient temperature on dust explosibility is important in some industries. Figure 4 illustrates the relation of temperature in the laboratory furnace to the relative flammability of mine-size Pittsburgh coal dust and to the permissible oxygen content in the atmosphere for through-200-mesh dust. The latter curve also gives the ignition temperatures of dust clouds in air-carbon dioxide mixtures with indicated oxygen contents. The hazard of high temperatures is evident from this figure.

The oxygen limits for preventing ignition of dispersions of through-200-mesh dusts were determined for six samples in the presence of an electrical induction spark and in the furnace at 850° C. The samples included one semianthracite, one low-volatile coal, one medium-volatile coal, two high-volatile coals, and one lignite. The following results were obtained:

Sample No.	Coal	Limiting oxygen content, per cent	
		Spark test	Furnace test
1761	Semianthracite	(1)	11.5
1736	Low-volatile	(1)	10.5
1738	Medium-volatile	18.5	10.5
1740	High-volatile A	17.0	10.5
1746	High-volatile C	15.0	10.5
1763	Lignite	15.0	7.5

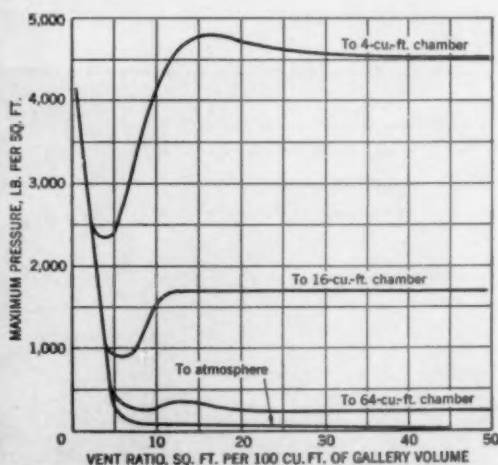
(1) Dust clouds could not be ignited by electric sparks in air.

In industry much reliance is placed on pressure-release vents in equipment and buildings for reducing damage from accidental explosions. Among the important requisites of effective vents, in addition to sufficient area, proper location, etc., is that they open rapidly to permit efflux of the combustion products during the initial stage of an explosion. Normally the vents open directly to the outside or are connected with the outside by short ducts. In such instances the maximum pressure is directly related to the area of the vent opening (frequently expressed as a ratio of the area to the volume of the enclosure). Occasionally, however, the explosion products cannot be released to an unlimited outside volume but must be led to an adjoining larger volume of limited size. Figure 5 contains several curves that show the relation of vent size (between a small explosion gallery and the adjoining larger chamber) to the maximum pressures developed by explosions of bituminous coal dust.

As can be seen, during venting to the outside atmosphere the pressure decreased rapidly as the vent ratio increased to about five and then, having reached a very low value, decreased very slowly. Venting to finite chambers, on the other hand, gave different results, the degree of variation depending on the volume of the chamber. Here an initial increase in vent ratio to 4-8 resulted in decrease in pressure, but further increase in vent size brought about a rise (sometimes quite considerable) in the maximum pressure, followed by a range of constant pressure. The odd pattern of these curves is explained by the ejection of quantities of unburned dust from the 1-cu. ft. gallery and the development of secondary explosions in the larger chambers.

In the course of venting tests in a 64- and a 216-cu. ft. explosion gallery, attempts were made to quench the

Figure 5—Venting coal dust explosions from one cu. ft. gallery to atmosphere and to cubical chambers of various sizes (dust concentration = 0.60 oz./cu. ft.).



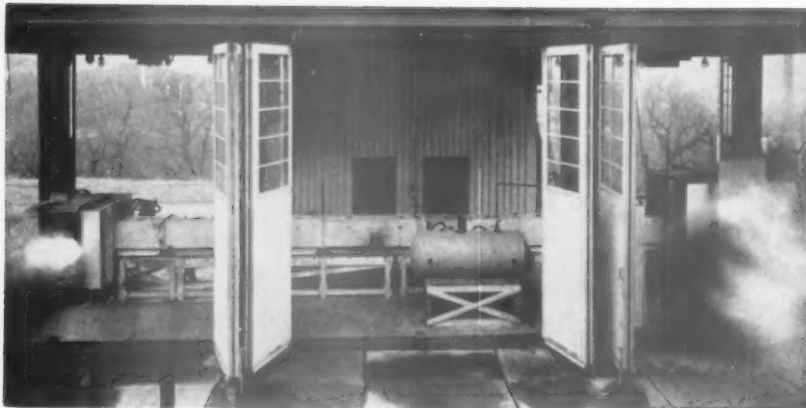


Figure 6—Shown at left are primary and secondary coal dust explosions.

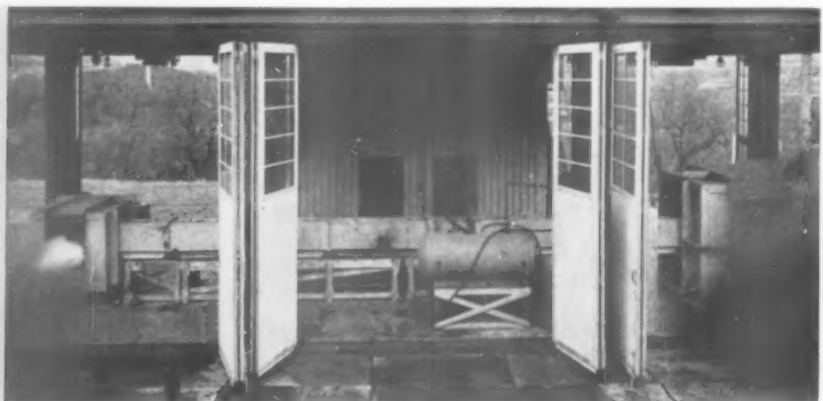
explosion flames during their incipient stages. With coal-dust explosions this was successfully done by dispersing water and limestone from a few polyethylene bags suspended at several points in the galleries. Dispersion was accomplished by electric detonators within each bag; the detonators were fired upon closure of an electric circuit, actuated by a sensitive pressure-pickup in the gallery.

In industrial explosions (and occasionally in mine explosions) frequently most damage is caused, not by the initial ignition, but by delayed secondary and even tertiary explosions, which generally involve greater quantities of dust and larger areas than the first explosion. Some studies have been made on the formation and prevention of secondary explosions. An explosion is started in the 64-cu. ft. gallery, from whence the pressure wave and flame travel through a 32-foot duct to the 216-cu. ft. gallery, in which dust had been placed on a shelf; in many experiments dust was also distributed on the floor of the duct. When no attempts are made to stop the explosion in the duct, usually stronger explosions are produced in the larger gallery. With bituminous-coal dust and with various other dusts it has been possible to prevent secondary explosions (see fig. 6 and 7) by placing vents in the duct, by dispersing water, limestone, salt, or other quenching mediums in the duct from V-shaped

troughs, from polyethylene bags, and by water sprays. The troughs were tipped by the pressure waves preceding the flame. In other tests the quenching agents were dispersed by detonators or quick-acting magnetic valves, following closure of electric circuits by pressure pickup devices.

In summary, the present investigation of American coal dusts ranging from lignite to meta-anthracite indicates that (a) the ignition sensitivity and the explosion hazard of coal dusts generally increases with increase in volatile ratio, but not in direct linear relationship; (b) the hazard of coal-dust explosions in an oxygen atmosphere is several times as great as in air; (c) explosibility increases with reduction in particle size—addition of 10 to 40 per cent through-200-mesh coal dust to coarser aggregates has an important effect on ignition sensitivity; (d) the effect of moisture on coal dust explosibility is unimportant below about 10 per cent; (e) increase in initial pressure and surrounding temperature increases the explosion hazard; (f) release of explosions to adjoining larger spaces of limited volume presents special problems and might result in strong explosions in the larger enclosure; (g) some dust explosions can be quenched successfully during their initial stage, and secondary explosions can be prevented by prompt dispersal of quenching agents.

Figure 7—Secondary explosion prevented by water spray in connecting duct.





Regularly scheduled maintenance is a very important factor in fleet safety and economy.

ACCIDENT CONTROL IN

TRUCKING OPERATIONS

by John D. Gallagher

SAFETY in truck operations often is regarded as something separate and apart from operating efficiency, but experience shows that there actually is a close relationship between efficiency of operation and control. The integration of accident control measures into everyday operating practices not only improves the accident experience, but also improves operating efficiency, and thereby increases the profit margin of the operation.

To keep both accidents and operating problems at a minimum, seven basic control factors must receive attention. They are:

1. Proper selection of vehicles for the transportation job to be done.
2. Proper scheduling of vehicles for safe and efficient operation.
3. Careful attention to routing.
4. Correct periodic maintenance, preferably according to a scheduled plan.
5. Use of definite, careful selection procedures in hiring drivers.
6. Thorough training of drivers in correct driving practices.
7. Effective control of drivers through proper supervision.

Application of these control factors has a double im-

portance—safety and profit—for weaknesses in the consistent application of any of these basic controls result in such things as accidents, damage to equipment and cargo, delivery delays, poor customer relations, speeding, poor equipment condition, road breakdowns, excessive maintenance, high labor turnover and high operating costs.

Selection of Equipment

For example, on a trucking operation vehicles were not being selected properly for the transportation job to be done and, as a result, often were being heavily overloaded. Consequently, brakes and steering mechanisms were in poor condition, and this resulted in some serious and costly accidents.

Also, some of the common conditions disclosed by a survey of this fleet included:

1. Worn steering links and bushings, and loose steering.
2. Spring U-Bolts loose and twisted out of position, and cracked spring leaves.
3. Reduced life of clutches and transmissions due to starting under excess load.
4. Reduced life of brake linings, and poor braking power under excess loads.
5. Excessive gasoline consumption.
6. Reduced life of wheel bearings.
7. A record of excessive road breakdowns.
8. Shortened serviceable life of trucks.

The proper selection of a truck for a specific transportation job is a detailed subject in itself. It involves making a thorough service-requirement analysis to determine the operating characteristics that will be required of the vehicle in service. If the vehicle is to be selected correctly for the transportation job to be done, the service requirements will be determined by such considerations as:



John D. Gallagher is a member, Greater Chicago Chapter of the Society. His article is based on more than 15 years of experience in working with motor vehicle fleets as a safety engineer with the Hartford Accident and Indemnity Company.



Counseling with a driver often can bring about improvement in attitude and result in better accident record.

1. Whether it will operate over hilly or level terrain, on short or long runs, over smooth or rough roads; with a fixed maximum, variable or diminishing load; whether it will operate in the city, where there is frequent starting and stopping, or over the road, or in intermediate areas.

2. The amount of maximum payload.

3. The steepness of grades traveled, and percentage of total mileage when loaded which will be uphill.

This service-requirement analysis is then used as the basis for determining the specific characteristics that vehicles should have to give efficient service under the operating conditions they will encounter, such as load capacity, braking power, body type and size, wheel base, use of single or dual wheels and single or tandem axles, engine horsepower and R.P.M., type and capacity of rear axle, rear-axle ratio and use of two-speed axles, correct transmission ratios, and optimum number of transmission speeds.

Obviously, if adequate attention is not given to the selection of proper equipment, vehicles will be improperly sized for their service requirements, and experience shows this may result in accidents, poor equipment condition, inefficient vehicle operation, road break-downs, excessive maintenance and other related problems. Also important is the provision of adequate accessories and road emergency equipment.

Scheduling of Equipment

Proper scheduling of equipment involves the assignment of trucks that are in good operating condition, to handle loads within their designed load capacity and within legal load limitations, over runs of the type for which their operating characteristics were selected.

What can happen when improper scheduling occurs is illustrated by the following incident:

A gasoline trucker received a call from a refinery to make a rush delivery. The call came during the peak of the delivery schedule and no spare trucks were available. However, a truck had been brought into the shop for some brake adjustments and minor repairs and, since

the vehicle had come in under its own power, the dispatcher sent it on the refinery job rather than wait for another truck.

After loading, the driver started the trip, but did not get far before he ran into a traffic situation that required a fast emergency stop. His brakes did not hold, and a bad accident resulted, with considerable damage to the truck. Also, the truck was delayed at the accident site so that delivery of the rush load was held up longer than it would have been if the dispatcher had waited until a truck in good condition was available. So that, as the result of a weakness in scheduling this run, there was a bad accident, considerable damage to the truck, and a very serious delivery delay.

In his work the dispatcher must not only give consideration to routing of the cargo from the pick-up point to its destination, but also must bear in mind which trucks are available and in closest proximity to the point of pick-up, their size with regard to the legal load limitations of the states into which they may operate, and the working hours of the driver who will be assigned to drive.

It always is important that no driver be dispatched who has not had sufficient sleep. His reactions will be slow in emergencies and, in such cases, it is not uncommon for the driver to fall asleep at the wheel. In the past many serious accidents have resulted from this situation.

Scheduling of hurried deliveries at any time can result in accidents, because the driver then tends to drive faster than is safe for road, traffic, and weather conditions. Also, during the winter when ice and snow cover the highways in many areas, it must be remembered that posted speed limits often are too fast. Unless the driver operates at speeds considerably below posted limits, ice on the road can cause skidding, jack-knifing—and accidents which result in injuries, damage to equipment and cargo, delivery delays, and other excessive costs.

Routing of Equipment

Proper routing of equipment is an important control factor because there are certain street and highway conditions that predispose towards accidents and other operating problems, and are better avoided when possible by the use of alternate routes.

For example, a petroleum contract hauler let his drivers choose their own routes. On one run the driver had a choice between a narrow, winding road with narrow bridges, and a broad, straight road with fewer and broader bridges. Because of a favorite coffee stop, the driver chose the narrow road.

He drove onto a bridge approach just as another truck started through from the opposite end. Because the bridge was narrow, the gasoline driver applied his brakes to allow the other truck to clear first. There was a patch of ice on the bridge approach. His tractor slid onto the bridge and the trailer-tank jack-knifed against a corner of the concrete bridge abutment. The cargo tank ruptured, the gasoline cargo caught fire, the driver was burned up in the cab, and the intense heat of the fire weakened the bridge structure so badly that it collapsed into the river.

If this driver had been required by routing procedures to use the other route that had no narrow bridges, he could not have run into the kind of situation which caused this accident and resulted in loss of his own life,

and the costly destruction of vehicle and bridge.

Accident exposure usually is greater where roads are narrow, winding or hilly; where traffic is congested; at dangerous railroad crossings or street or highway intersections; school zones; narrow bridges. Locations where trucks may be delayed—such as railroad crossings that hold up traffic because of long freight trains and extensive switching operations—also should be avoided, for drivers have a tendency, after delays, to speed to make up the lost time, which results in an increased accident exposure.

Inadequate attention to careful routing may result in speeding, accidents, damage to equipment and cargo, delivery delays, and so on, which combine to create unnecessary operating costs.

Maintenance of Equipment

In some motor vehicle fleets, equipment maintenance consists simply of letting things go until some particular part goes wrong; then that particular item is repaired, and things are let go again until some other item requires repair. However, when various truck parts become worn, their play imposes excessive stress and wear on inter-related parts, which shortens their life and reduces operating efficiency. A haphazard program of "repairs when needed" often proves more expensive in the long run than a program of periodic preventive maintenance which specifies replacement of parts or unit assemblies at definite time or mileage intervals, before troubles show up.

An example of what may happen as a result of inadequate attention to equipment maintenance is the case of a certain wholesale bakery fleet of about 300 trucks. As a consequence of a poor maintenance program the trucks were in generally poor condition, which caused accidents due primarily to poor brakes, defective steering and other equipment defects. Also, a check of their records showed they were averaging 43 road breakdowns a month. Every time they had a breakdown they had to send out a second truck, and transfer the cargo for continued delivery. There also were costs of towing in broken down trucks, delivery delays, poor customer relations and a definite loss of sales.

Optimum efficiency of vehicle operations usually is secured through periodically scheduled preventive maintenance, which generally results in fewer breakdowns and road calls, increased life of equipment, a minimum possibility of accidents due to mechanical failure, and a lower cost of operation.

Selection of Drivers

An example of what can result from poor driver selection procedures may be seen in the experience of a gasoline contract hauler a few years ago when a man applied for a driver's job. During the interview this man made an excellent impression, and indicated he had considerable experience in truck operation.

When asked for his chauffeur's license, he said he had left it at home in his other clothes, but would bring it in later if desired. At the time of the interview there was a truck standing idle in the terminal, and the applicant was hired on the spot and assigned to take the idle unit out immediately.

Witnesses later told how, when he came to a curve in

the road, instead of following the road around the curve, his truck kept going straight ahead and piled up in the ditch. The truck, which was carrying a cargo of gasoline, caught fire and burned up, cremating the driver in the cab and also fatally burning a hitch hiker whom the driver had picked up along the way.

Before he died the hitch hiker stated that the driver had done an excellent job of driving up to the point of the curve on the road, but at that point he had some kind of a seizure which caused him to lose control of the vehicle, and resulted in the accident.

Investigation disclosed that the driver had once had a chauffeur's license, but that it had been revoked recently because of epilepsy. The verdict in this case was that an epileptic seizure was responsible for the man's losing control of the truck. A good driver selection procedure would not have put this man to work until after his previous driving and employment record had been checked, and the man had produced a valid chauffeur's license.

In less extreme cases, the experience of some truck operators has been that they were hiring many drivers with bad driving habits. As a result of speeding and following too closely, some of them were hitting bumps too hard, causing tire damage, bent steering arms and even bent axles. They were having to make hard emergency stops that overheated the brake drums and caused other brake damage, that bent the rear spring center-bolts on the tractor, throwing the unit out of line and causing excessive tire wear and hard steering. Some drivers were not double-clutching properly, causing chewed-up transmission gears. Some were not shifting down in gears on grades, so that they lugged the motor, resulting in overheating and damage to the motor. Some were backing in too hard against loading docks, causing banged-up rear ends on trailers and bent rear-spring center-bolts on the tractor. These bad driving practices, resulting from poor driver selection, also were responsible for frequent accidents, and necessitated excessive maintenance.

Recognized good practices in the selection of drivers require a satisfactory interview with the applicant; refer-

Complete accident record on each driver is a must to form intelligent basis for retraining, counseling or penalizing when necessary.



ences which will show a good record with regard to driving and other employment experience, when checked; and an applicant should be given a road test in which his driving ability and habits can be evaluated. Some companies give applicants written tests on traffic knowledge, intelligence or attitude. All applicants should, of course, pass the I. C. C. physical examination. Hiring often is on a probationary basis, so that any men who are not up to standard can be released before the date when the union contract gives them permanent status as drivers.

Training of Drivers

The thorough training of drivers is especially important in trucking. In a factory a supervisor can observe the operations of his men and correct unsafe or poor work practices at the time they occur. A truck driver, on the other hand, is out on the streets or highways, and away from supervision. That also is where his accidents happen, and so thorough training must be relied on for proper control of his operations.

One dry freight carrier hired some new drivers, and gave these men practically no training. One of these new drivers had had considerable driving experience, but it had all been on straight trucks on a city operation. One of his first runs was in bad weather over a hilly route with a tractor-trailer unit. While going down an icy hill he failed to apply his trailer brakes properly. As a result he jack-knifed and slid across the road, head-on into an oncoming car, smashing up the other vehicle and seriously injuring three people in it; and then he slid on into the ditch, with serious damage to his own unit and cargo.

One item of cargo was an especially built machine that the consignee was anxious to receive at his plant and set up in production as soon as possible. This machine was damaged to such an extent that it had to be sent back to the factory and rebuilt, which meant a considerable delay in delivery, and also resulted in poor customer relations for the carrier.

In this case failure to train drivers adequately resulted in an accident, damage to equipment and cargo, a serious delivery delay, and poor customer relations.

Good training develops good work habits. When a new truck driver is hired, it is important that he develop good habits of operation. In order to accomplish this, training should start as soon as the man comes on the job, and it should continue, in one form or another, pretty much throughout his entire period of employment.

When a man is not well trained he is apt to make mistakes, and in truck operations mistakes can result in accidents, damage to equipment and cargo, delivery delays, poor equipment condition due to bad driving practices, poor customer relations, excessive maintenance—which all contribute to high operating costs.

Supervision of Drivers

It is essential that the fleet safety director receive full backing and cooperation from top management, and from other supervisors, if the accident control program is to function smoothly and produce constructive results.

In truck operations, as in most other lines of business, men do their best work when their activities are well supervised. Where supervision is weak drivers often develop bad driving habits and other slipshod methods,

which mitigate against safe and efficient operation. Where this condition exists many opportunities are lost to improve the profit margin by reducing accidents and other operating costs which result from driver inefficiency.

Any supervisor gets his results by working through people, and he must work effectively with his people to get good results. The supervisor usually gets his men to do what he wants done, when he wants it done, and in the way he wants it done, because his good relations with these people make them want to do the job his way.

The efficient management of any business depends on an exercise of proper control over men, materials and equipment, and this control depends, to some extent, on the use of records. The keeping of accident records and costs is important to accident reduction, and for the supervision and control of drivers, as well as being a source of information for handling claims.

On each accident a detailed, written report should be made out by the driver involved, preferably with the assistance of the safety director, or otherwise of the local terminal manager. Accident reports and records should show clearly the unsafe acts of drivers and unsafe conditions of vehicles involved, and should suggest the ways in which these accident causes can be corrected to avoid any repetitions. This information should be related back to the basic control factors in which weaknesses exist, and then appropriate corrective action should be taken to correct these basic weaknesses.

Experience shows that when drivers do develop poor driving practices and slipshod job habits because of weak supervision, these result in such things as speeding, accidents, damage to equipment and cargo, poor customer relations, poor equipment condition, excessive maintenance, and so on, all of which add to operating costs.

Summary

In this discussion of the seven basic control factors, it may be noted in each case that accidents arise out of the same sources that also produce other operating inefficiencies and excessive costs. That is, accidents arise out of some weakness in applying one or more of these basic factors, and this weakness also is the source, at the same time, of the various other types of operating problems referred to.

For example, poor driver selection, training, or supervision may result in bad driving practices that cause accidents, poor equipment condition, road breakdowns and excessive maintenance. These undesirable problems all can be corrected, not alone by retraining the individual drivers involved, but by basic improvement of the weaknesses in existing practices with respect to driver selection, training or supervision.

That is, constructive basic correction obviously lies in improved application of the seven control factors. This correction contemplates a consistent program of accident investigation and periodic accident analysis and study, combined with a continuing study of weaknesses in operating controls. Pinpointing those control weaknesses which may exist, as part of a well organized and administered safety program, paves the way to their correction. Sources of both accidents and other related operating problems are eliminated or minimized through better control over common accident sources.

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MILWAUKEE

Milwaukee, Wisconsin

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★

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MOBILE

Mobile, Alabama

MOHAWK VALLEY

Utica, New York

NEW JERSEY

Newark, New Jersey

NEW ORLEANS

New Orleans, Louisiana

NIAGARA FRONTIER

Buffalo, New York

NORTH CAROLINA

High Point, North Carolina

NORTH FLORIDA

Jacksonville, Florida

NORTHERN OHIO

Cleveland, Ohio

NORTHWEST

Minneapolis, Minnesota

OKLAHOMA CITY

Oklahoma City, Oklahoma

PANHANDLE

Borger, Texas

PENN-JERSEY

Trenton, New Jersey

PHILADELPHIA

Philadelphia, Pennsylvania

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Seattle, Washington

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SOUTH TEXAS

San Antonio, Texas

SOUTHWEST

Dallas, Texas

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Spokane, Washington

TULSA

Tulsa, Oklahoma

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Wichita, Kansas



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Salt Tablets... In brightly colored throw-away dispensers each containing, 1,000 orange, non-nauseating salt tablets. Easily fastened to wall with supplied brackets so you can establish heat fatigue stations throughout your plant and in the field.



Venex... Here's complete treatment for snake bite in a compact pocket pack. Venom-extraction method so simplified, victim can treat himself. Should be one issued every field crew and in every vehicle. Available also with first aid material in new VEN-AID heavy duty pack.

ImunOak* ImunIvy*... Packaged in 1 cc. vials, each vial contains 1 grain extract of oak or ivy. They are taken two or three weeks prior to first blooms of the plant in spring. Suggested dosage is 1 vial in 1/2 of a glass of water two or three days in succession, followed by a monthly booster during the season.

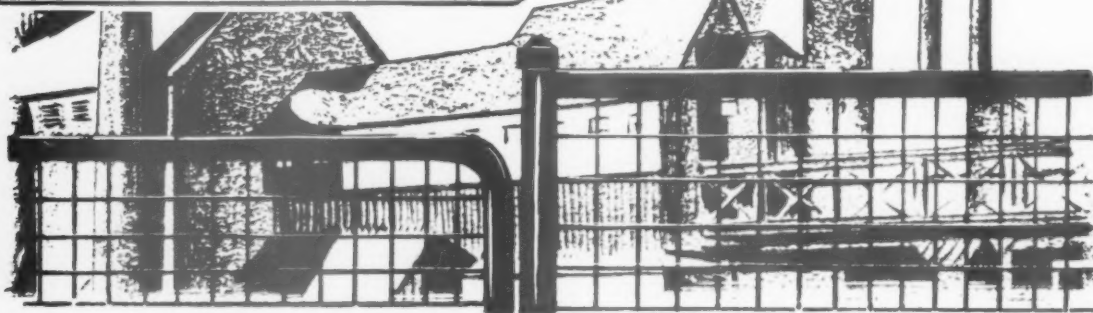


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ACCIDENT PREVENTION • steel SIGNS IN STANDARD COLORS AND DESIGNS

Field Service Department Honors Two on Retirement



Admiring the gifts at the farewell reception are (left to right), Paul F. Hill, manager, Field Service Department; Tom Burke; Mrs. Robinson; Ralph Robinson, and Executive Vice-president George C. Stewart.

FELLOW workers of the NSC staff bade goodbye December 30 to two long-time members of the Field Service Department. The retirement of Tom Burke, field representative in the western states, and Ralph Robinson, Field Service staff member in the Chicago headquarters, came after many years of outstanding work in safety.

At a reception in the Council offices, Ralph was presented with a silver service and Tom with a 35 mm. camera and an attache bag. The gifts were from staff members and from co-workers in the San Francisco office. In addition, they were given letters of appreciation from Gen. George C. Stewart, executive vice-president.

Neither man has ended his career in accident prevention. Ralph has gone to the West Coast where he expects to do some safety work and Tom plans a four-month safety assignment in Europe this summer.

The texts of the letters of appreciation follow:

December 28, 1955

Dear Mr. Burke:

On the occasion of your retirement

from the National Safety Council, I write to express the Council's appreciation for the outstanding contribution you have made to its achievements.

From the time you joined the Council staff in 1928, you have handled your assignments with skill and a deep understanding of the issues involved.

You came to the Council as Director of Publicity. In addition, you were editor-in-chief of four of the Council's monthly publications. Also, you were the author of a series of highway safety editorials that ran for 23 weeks in *Liberty Magazine* and were widely read.

When radio networks pioneered in using accident prevention material, you developed a "Universal Safety Series" which was used extensively.

You left the Council in 1937 to go to New York to become executive secretary of the Advertising Club of New York and in 1940 you were made executive vice president of the Greater New York Safety Council. In this capacity you served with great success.

In October 1943, you returned to the Council staff to direct the program for Community Councils, in the Field Organization Department. In this work, your knowledge of community safety problems, and your ability to plan programs and develop materials proved of real value.

In 1952 you were transferred to the San Francisco office where you served as field representative in the western states. In the course of your duties you prepared the publications of the Field Service Department in addition to

BULLARD'S REPELLANT

Repels mosquitoes, chiggers, red bugs, fleas, flies, gnats and other insects for eight to ten hours. Non-irritating spray can be used on clothing and equipment, in vehicles or as a mist around working areas. In 6 ounce aerosol spray cans . . .

write for circular.
E. D. Bullard Company,
San Francisco, California



plan
now
for this
summertime
hazard



Proper immobilization at scene of accident with new stretcher

Here's another use for the versatile new Haggard's all-purpose stretcher kit. No matter what type of stretcher you now have, you have need for the new Haggard. It does all the things any stretcher can do, plus many more. It is a complete unit ready for instant use anywhere. It is so compact that it fits into a car trunk. Lightweight, only 28½ pounds complete with case, blanket, first aid supplies, and accessories. It's such a totally new concept in utility, versatility and practicality that you should investigate it at once. See how easy it is to store, transport, and put to use. See all the advanced, needed features that make it a combination litter, fracture board, traction splint, and resuscitator. Compact, convenient, complete. Ask your MSCO distributor for a demonstration or write Medical Supply Company, Rockford, Illinois. In Canada, Safety Supply Company, Toronto 2.



ACCO Registered* Wire Rope Slings



Get This Flexibility with Cable Laid Construction In-- **THE SAFEST SLINGS MADE**

• The operating people in your plant will appreciate the money and time-saving advantages of Cable Laid Slings. For these specialized slings combine the flexibility of manila rope with the strength of steel. And to this extreme flexibility they add freedom from crankiness and resistance to kinking. The result is a sling which handles easier—saves time—cuts operating costs.

The secret of cable laid slings is in the construction of the wire rope. It is a combination of six individual wire ropes, not strands, laid around a special steel center. These ropes are coated with a special GALACCO coating for maximum corrosion resistance. And ACCO's patented DUALOC endings give extra strength and safety to the finished sling.

SAFEST SLINGS MADE. ACCO cable laid slings, like all of the other slings in ACCO's complete selection, are registered—incorporate extra safeguards, which make them the safest slings made.

Each individual component, made from the highest quality material suited to its use, is tested before assembly—must prove to have strength equal to or greater than the sling body. These components are then assembled into slings according to precisely-engineered designs which have proven their safety and reliability in extensive field tests.

Each completed sling is then proof-tested at twice the load-carrying capacity for which it is rated. Then, and only then, does it receive the coveted registration certificate and tag.

Get the details on Cable Laid, or any other ACCO Registered Wire Rope Slings, from your distributor—or call the nearest ACCO district branch below.

FREE FOLDER: Write the Wilkes-Barre office for your copy of new folder **DH-532** which gives details on ACCO Registered Cable-Laid Slings.

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speaking before many important groups.

You may well take pride in your entire distinguished record of service to safety.

The best wishes of the Council will follow you in all your future undertakings.

December 28, 1955

Dear Mr. Robinson:

On the occasion of your retirement from the National Safety Council after more than fourteen years of faithful service to the Council, I write to express to you the Council's appreciation for all you have contributed to its achievements.

From the beginning of your service, in 1936, you have represented the Council in many important projects, with integrity and ability.

Among your larger accomplishments during the period from 1936 to 1940, was your part in the organization of the Greater Los Angeles Safety Council, the Seattle Traffic and Safety Council, the Portland Traffic Safety Commission, and the Long Beach (California) Traffic and Safety Council.

You left the Council in 1940 to go with the Texas Safety Association where your contribution to the cause of safety continued to go steadily forward.

In 1946, you returned to the National Safety Council to assist with the Green Cross Campaign in the Western Region. There your sound knowledge of community safety organization proved of great value.

Upon the conclusion of this assignment in 1948 you returned to our headquarters staff in Chicago where your work has been marked by enthusiasm, excellent judgment, and wide knowledge in field safety problems.

You may well take pride in your entire distinguished record of service to safety.

The best wishes of the Council will follow you in all your future activities.

AEC Announces State Advisory Group

LEWIS L. STRAUSS, chairman of the Atomic Energy Commission, has announced establishment of a 12-member Advisory Committee of State Officials to consult with the commission on regulations concerning health and safety aspects of private atomic energy activities.

The committee members represent state agencies such as health, labor, public utility, and legal departments. Some are from states already doing work in radiation

protection. Those who have been invited to serve are:

Dr. Daniel Bergsma, New Jersey Commissioner of Health.

A. C. Blackman, chief, Division of Industrial Safety, California Department of Industrial Relations.

Dr. Roy L. Cleere, executive director, Colorado State Department of Public Health.

James G. Frost, Deputy Attorney General of Maine.

B. A. Poole, director, Bureau of Environmental Sanitation, Indiana State Board of Health.

Clarence I. Sterling, Jr., director and chief sanitary engineer, Division of Sanitation, Department of Public Health of the Commonwealth of Massachusetts.

Dr. Irving Tabershaw, director, Division of Industrial Hygiene, New York State Department of Labor.

Dr. Albert E. Heustis, commissioner, Michigan Department of Health.

Curtiss M. Everts, Jr., director, Division of Sanitation and Engineering, Oregon State Board of Health.

Donald P. Roberts, chief, Industrial Hygiene Section, Tennessee Department of Health.

Dr. Arthur B. Welsh, Medical Coordinator for Civil Defense, Department of Health of Pennsylvania.

William T. Linton, executive director, Water Pollution Control Authority, South Carolina State Board of Health.

Decision to establish the advisory group is an outgrowth of a meeting of state representatives in Washington last July with the AEC to discuss proposed regulations on radiation protection being formulated for AEC licensees.

Among advantages expected from the consultative arrangement the AEC cited the following:

—Close cooperation between the AEC and the states should help in attaining uniformity in regulations. Some states have already issued, or are about to issue, codes and regulations on radiation protection; others are doing preliminary work.

—Working through the advisory committee the commission will keep informed of the needs of the states and will be better able to help states requesting technical guidance.

—In general, the arrangement will provide for exchange of information which will be of aid to the commission in discharging its regulatory responsibilities and to the states in keeping themselves informed of the activities of the commission.

BULLARD'S FORMULA QUICK RELIEF • POISON IVY POISON OAK • SUMAC

Odorless, greaseless and safe to use even around the eyes. Bullard's Formula provides protection against these plants and speeds healing—stops itching when applied after rash appears... Write for photographs of actual tests.
E. D. Bullard Company
San Francisco, California



plan
now
for this
summertime
hazard



Sounds for Safety

engineered by

FALCON

New Falcon Automatic Fire Detectors and Alarms provide constant protection wherever fire is a hazard. Self-powered by DuPont "Freon", they give early warning at first sign of fire.

U. L. Approved for 20 Ft. Spacing—Low Cost—Non Electric—Easy Maintenance—Easily Installed—30 Yr. Guarantee.

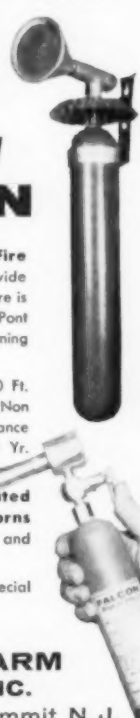
Falcon manually operated Emergency Signaling Horns are portable, self-contained and "Freon" powered.

Many types and sizes. Special designs for special uses.

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SEVERAL SALES TERRITORIES NOW OPEN



VOICE OF THE READER



Comments on topics of current interest are invited. They need not agree with the views of the editors

The New Look

TORONTO, ONT.—Hearty congratulations on the new dress and new departments in the January issue of the *News*.

This has always been a very fine magazine but seems to me to be greatly improved—and that takes a lot of doing when you start with an article of the standard the *News* has always been.

R. G. D. ANDERSON, *General Manager, Industrial Accident Prevention Associations.*

LUKE, MD.—Congratulations to the editorial staff of *NATIONAL SAFETY NEWS*. January's issue is greatly improved.

JOHN J. LONG, *Director, Safety and Plant Protection, West Virginia Pulp & Paper Co.*

NEW YORK—Thanks for sending us copies of the January issue presenting the article on Dr. Sperry and his safety work.

We think it is excellently handled. In fact, the whole magazine has a nice approach to and treatment of safety subjects—that should do a great deal of good. You certainly make the subjects newsy, interesting, and impressive.

VICTOR H. SCALES, *Hazard Editorial Offices*

SAN FRANCISCO — Congratulations on your new format for *NATIONAL SAFETY NEWS*. Friday, I attended the last session of the Bullard western sales meeting. We had a number of copies of the January issue there and I wish you could have heard the very favorable comments on them.

DAVID J. McDONALD
Wank, McDonald & Lee, Advertising

We Do It—Let's Name It

NEW HAVEN, CONN. In order for those who are engaged in preventing accidents to achieve recognition as an independent profession we must have a profession and we must act independently.

We do have a profession. There are many hundreds of men engaged in the work of accident prevention who have the background, the skill, the balance, and the integrity which is comparable in every way to the recognized professions. The prevention of industrial accidents over the years is one of the great success stories of American industry. It is too little known, little advertised and often unrecognized. The success of those engaged in industrial accident prevention is exceeded only by their modesty.

We have not acted independently. We have been content to tie ourselves to the coat tails of the engineers and string along in their shadow. We should stand on our feet and make our own way.

One of the stumbling blocks is nomenclature. Let's change it.

We are devoted to and skilled in the prevention of accidents. The correct name is *Anaccidist*—literally "one who is engaged against accidents." From an etymological standpoint this is the right word. It is, furthermore, an all-inclusive word which can indicate the work of those who may be preventing home accidents, vehicle accidents, public accidents, or industrial accidents.

We do it. Let's name it.

EVERETT W. MARTIN, *Editor Connecticut Journal of Industrial Safety*

It's easy to tell when you're on the right road—it's upgrade.

Chain Tester Guards Against 'Weakest Link'

THIS HYDRAULIC chain testing machine has been installed at the Torrance, Calif., plant of The National Supply Company to make



sure that even the weakest link is strong enough for the load entrusted to it.

Clinton Maggard, a chain man at the plant, is shown placing a chain in position for testing. One end is anchored in a fixed position and the other is linked with a hydraulic cylinder, capable of exerting up to a 50,000-pound pull.

The amount of pull applied to a chain can be controlled by the operator and is indicated on a pressure gauge. Any yield in the chain causes a rod to move, signifying that the chain is unsafe for such a load.

The wire guard seen above the machine is lowered over the chain during testing, to protect the operator in case of chain failure.

Designed by L. L. Babcock, the machine was built to his specifications by plant personnel, for use in the Maintenance Department. Hooks, connecting links, and the crane link can be tested simultaneously with the chain.

All chains used at the plant are identified by number and are proof-tested at regular intervals, and after any repair, to a load at least 50 per cent in excess of that for which they are rated.

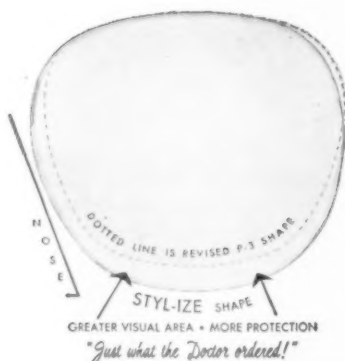
WHEN YOU
MAKE THE CHANGE

GO ALL THE WAY

GO



STYLED FOR EACH EYE



Select a lens shape like the Profession prescribes—tailored and shaped individually to fit snugly against opposing slopes of the nose. Wider vision, both vertically and horizontally, gives maximum visual efficiency and the greatest area for protection. USSSCO's SAF-I-SPECTACLES, with Styl-Ize industrial Lens Shape, meets these requirements. "Just what the Doctor ordered."

Here is the record: During the past year this new SAF-I-SPECTACLE has established new standards for worker acceptance, and lower accident frequency rates, in a steadily growing number of "blue chip" industrial plants. The enthusiasm of this acceptance has far exceeded our most favorable estimates!



Meets Federal specifications

A NEW SIDE SHIELD DESIGN

available in clear or green plastic

- more attractive
- more comfortable—lighter
- more ventilation—non-fogging
- offers full side protection permits flat, convenient folding



Users state that the new SAF-I-SPECTACLE has been widely accepted because of:

new industrial styling in modern Styl-Ize shape
different for men and women

choice of colored frames

in strong Butyrate: bronze, burgundy, crystal, slate blue

new shatterproof OPTILITE* lens

a lighter yet stronger lens, completely eliminating the objection of heavy weight . . . with twice the strength and half the weight of hardened glass. Available in Rx or Plano, bifocal or single vision.

Choice of 44 and 47 eye sizes. Integral or adjustable nose pads, spatula or riding bow cable temples. Also available with hardened glass lens in Plano or Rx.

* OPTILITE® — a new superior safety lens material . . . not a glass . . . not a thermoplastic, but an exclusive USSSCO formula of compound resins.

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USSSCO products are developed, manufactured, and sold direct to the user by the United States Safety Service Co., through a staff of trained, full-time service engineers. Look in your phone book Yellow Pages for nearest sales office, or write us in Kansas City.

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- OPTILITE or hardened glass lenses, in Plano or Rx, Single Vision or Bifocal

From a Safety Ambassador's Notebook

By NED H. DEARBORN

EDITOR'S NOTE: During the past year, the National Safety Council's president traveled many thousand miles, visiting the Far East, South America, and Alaska, observing safety programs in military installations and civilian industries. Here are some of his comments on people, places, and programs.

Japan

The Japanese Ministry of Labor has a deputy minister, Mr. Saburo Noguchi, whose function is the development and supervision of occupational safety programs. There

is also the Federation of Industrial Safety Associations headed by Mr. Ichuro Ito. Then there is perhaps the oldest safety organization in Japan whose chief executive is Mr. T. Gamo. This organization concerns itself with activities other than occupational safety.

It was my good fortune to be the guest of the Ministry of Labor and the Federation two full days, one in Tokyo and the other in Nagoya. The Institute honored me on another day at a luncheon attended by some 35 government officials and industrial and civic leaders.

On my first day with the Japanese I visited the Federation headquarters, the Safety Museum, and a large steel mill, addressed about 700 Japanese representatives of the industrial safety associations, attended a wonderful reception, and concluded the day with a dinner party conducted in the charming traditional manner.

At Nagoya I was shown a large aircraft plant which is under contract with the Far East Air Force to maintain and repair airplanes. Then a tour of a pottery plant, and a place where the artistic cloisonne is produced. In the afternoon I addressed another Japanese audience of 500 Association representatives. Dinner in the evening at the Nagoya television tower.

President Yosomatsu Matsubara of the Hitachi Shipbuilding and Engineering Company paid National Safety Council offices a courtesy call three years ago. His company, employing some 15,000 workers, had reduced its frequency rate from 98 to 9 in two years. He explained that, under Japan's new constitution, laws were passed requiring government inspection of industrial plants throughout the empire. He also said that our Council materials had greatly aided their safety program. My conversations with Japanese business leaders while I was there last April bear out his testimony. It is gratifying to know that our publications and services are used and appreciated and it also adds to our responsibilities.

I wish I could in this short report share adequately with our members the many fine tributes paid the National Safety Council and the honors and courtesies extended to your president by the Japanese. The same can be said for other places visited on this far eastern journey — Okinawa; the Philippines; Guam, and our own beautiful territory, the Hawaiian Islands, two of which I visited.



The safety banner flies proudly over the safety scoreboard of Creole Petroleum Corp. at Tia Juana, Venezuela. The inscription is in Spanish but the Green Cross has been recognized everywhere as the safety symbol.

*She saw Wausau! A noted magazine
Editor-Publisher discovers a city with an
unusual name—where even the people
and their way of life seem different*

Wausau Story

by ENID A. HAUPT, Editor-Publisher of Seventeen Magazine

"It's not too big—as cities go. About 30,000 population. But there's a certain spirit about Wausau that's really unique. A 'personality' that's easy to meet and to live with. I sensed it the moment I arrived in town.

"Wausau people have a kind of warmth and down-to-earthness that I like. 'Hominess,' I guess, is the word for it.

"Take Norton Leaps, for instance. He's a friendly, energetic World War II veteran with a knack for flowers. 10 short years ago he started a floral shop and greenhouse. Today he has two greenhouses and will soon blossom out with a third. As we chatted, I could see how happy he was with his work and with Wausau. Obviously, Wausau is equally happy with him.

"But there's another side to this friendly, easy-going attitude of Wausau people. I found that folks up there don't seem to take up fads. They seem to enjoy the freedom of being themselves—not trying to copy someone else.

"Wherever I went in Wausau—on the streets, in the stores, at the television station, the depot, the hotel—I saw more individuality than I've seen in many larger cities.

"At Wausau Senior High School, for example, I met scores of young people. Yet in their dress, manners, and speech—even the way the girls wore their hair—there was no faddishness, no following of a current craze.

"Later that day, at dinner, I found this same refreshing attitude in the people from Employers Mutuals. I wasn't at all surprised. For they're Wausau people—with a Wausau way of doing things. No wonder they've gained a reputation for being good people to do business with."



Mrs. Haupt visits Miss Kurath's (standing at left) Home Economics class at Wausau Senior High School.

Employers Mutuals of Wausau are "good people to do business with"

The "Wausau personality" which Mrs. Haupt discovered is not restricted to Wausau's city limits. The same individualism, the same straightforward desire to do a job right can be found with the folks of Employers Mutuals in any of the 90 cities where we have offices. There's a little

bit of Wausau in each of the 48 states!

What fields do we cover? Everything but life insurance. We write all types of casualty and fire insurance—including automobile. And we're one of the very largest in workmen's compensation.

In all of these we think you'll appreciate

our fairness and unexcelled service on claims—and our dedicated field force with whom you deal *directly*.

So if you want information on how we can serve your insurance needs, we invite you to phone a local office or write to us in Wausau, Wisconsin. We'll give you the facts quickly and honestly. For that too, is the "Wausau Way" of doing business.



"You're a fortunate man," Mrs. Haupt tells Norton Leaps, florist, "to be able to make your livelihood from something you love."

Employers Mutuals of Wausau





Presentation of Council awards to the armed forces in the Far East at a ceremony in HQ AFPE/8 Army. Left to right: Maj. E. J. McGaw, Commanding General, KCOMZ, Col. Harry T. Meyers, Third Transportation Command; Ned H. Dearborn, president, NSC; Gen. L. L. Lemnitzer, Commanding General, AFPE/8 Army; Col. R. J. B. Page, Deputy District Engineer, Okinawa Engineer District; T. H. Wilkenson, then director of safety, HQ AFPE/8 Army. Gen. Lemnitzer, Col. Page and Col. Meyers received safety awards for their commands. (Official U. S. Army photo by Pfc. Harold Lischkoff.)

The main point of this report is, of course, the progress being made in occupational safety in Japan. For their accomplishments a rousing round of applause is well deserved.

Lago

The history of the Lago Oil and Transport Company, Limited, reads like a fairy book. Indeed, it is a fabulous story from the pages of America's fabulous industrial history.

Only a little more than a quarter century old, it is the largest oil refinery in the world. In 1954 it was handling 428,000 barrels of crude oil daily. It is a subsidiary of the Standard Oil Company of New Jersey.

Lago is on the Netherlands West Indies island of Aruba. The advent of Lago marked the beginning of a complete transformation of Aruba's population, then about 10,000. From an arid agricultural island it became a bustling industrial center. Of its present population, some 6,500 are employed by Lago. Aruba is only 12 degrees north of the equator but the trade winds make life comfortable.

The president of Lago and his able staff take great pride in their safety record, as well they may. Interest in safety is high throughout the plant—in fact, throughout the island. I had several talks with Aruba's chief of police, Mr. Willemssen, about traffic safety. Lago



has issued an attractive pamphlet on "Safe Driving."

Highly commendable is Lago's policy on employee relations and community development. This is not the place to describe these interests but where an enlightened management follows such a pattern there is sure to be a good safety program also.

Creole

The Creole Petroleum Corporation is the largest producer of the 18 companies operating in Venezuela. Its headquarters is in beautiful Caracas and it has two large oil fields—its western division on

Lake Maracaibo, and its eastern division, a land operation east of Caracas. Together they produce approximately a million barrels of oil daily. Creole is a subsidiary of Standard Oil Company of New Jersey.

My visit was largely a conducted tour by launch of the Maracaibo Lake wells, of which there are about 1,200. I saw at close quarters, on or alongside drilling barges, a pipe-laying barge, flow stations, a pile-driver barge, the Tia Juana Gas Conservation plant No. 1, the Ule-Amuay pump station, and at La Salina a pile cast-

—To page 136



Let this "Visiting Fireman" train your men to fight fire... it could save your business

You have a *potential* fire-fighting team right in your plant. These would-be fire fighters *could save your business if fire struck unexpectedly*. All they need is training, the kind that will enable them to respond instantly and properly to any kind of fire emergency.

Ansul can provide this training for a group of your men just as it has for hundreds of its customers. And there will be no charge. It is just one of the "essential" services that Ansul provides for its customers.

Twenty years experience in the fire protection industry has proved to Ansul many times over that all the fire equipment in the world will not save your business *unless* trained hands are available to man that equipment. So, it is important to Ansul that you get

training along with the fire equipment you buy. Only then will you experience the security that goes with having a complete fire protection program. Only then will you get what you really pay for, what you really need—*complete fire protection*.

You owe it to the life of your business to learn more about Ansul's in-plant fire training service. Get in touch with your local **ANSUL MAN** through the yellow pages of your phone directory, he will be happy to call on you and explain all of Ansul's customer services in detail. Or write to **THE ANSUL CHEMICAL COMPANY, Dept. NS-2, Marinette, Wisconsin.**



COMING EVENTS



*in the
field of safety*

Feb. 2-3, San Francisco

Sixth Annual California Statewide Meeting, Governor's Industrial Safety Conference (Fairmont Hotel). A. C. Blackman, chief, Division of Industrial Safety, Department of Industrial Relations, State of California, 965 Mission St., San Francisco.

Feb. 28-Mar. 1, Urbana, Ill.

Forty-second Annual Illinois Highway Engineering Conference. John W. Hutchinson, 303 Civil Engineering Hall, University of Illinois, Urbana, Ill.

Feb. 29, York, Pa.

Annual Industrial Safety Conference (Valencia Ball Room). Sponsored by the York County Safety Council of the York Foremen's Club. Quentin R. Stambaugh, secretary, P. H. Glatfelter Co., Spring Grove, Pa.

Mar. 4-6, Atlanta, Ga.

Southern Safety Conference and Exposition (Biltmore Hotel). W. L. Groth, executive director, P.O. Box 8927, Richmond 25, Va.

Mar. 7-8, Philadelphia

Twenty-second Annual Philadelphia Safety and Fire Conference and Exhibit (Broadwood Hotel). Walter W. Matthews, managing director, Philadelphia Safety Council, 121 S. Broad St., Philadelphia 7.

Mar. 9, Berkeley, Calif.

Fourth Annual Eastbay Public Safety Congress (Hotel Claremont). Clinton W. Dreyer, managing director, Eastbay Chapter, National Safety Council, 1322 Webster St., Oakland 12, Calif.

Mar. 19-21, Los Angeles

Third Annual Southern California Safety Congress and Exhibit (Ambassador Hotel). Joseph M. Kaplan, secretary-manager, Greater Los Angeles Chapter, National Safety Council, 610 S. Main Street, Los Angeles 14.

Mar. 26-27, Dallas, Tex.

Seventeenth Texas Safety Confer-

Plan President's Conference On Occupational Safety



Seated (l. to r.): Vice Admiral G. F. Hussey, Jr., USN (Ret.), managing director and secretary, American Standards Association; Paul E. Gurske, director, Bureau of Labor Standards, U. S. Department of Labor; Secretary of Labor James P. Mitchell; Under Secretary of Labor Arthur Larson; Vincent P. Ahearn, executive secretary, National Sand and Gravel Association; General George C. Stewart, executive vice-president, National Safety Council. Standing (l. to r.): Lloyd A. Mashburn, general president, Int. Association of Lathers, Wood, Wire, and Metal Workers; R. H. Ferguson, assistant director of Industrial Relations, Republic Steel Corporation; Stanley C. Hope, president, Esso Standard Oil Company; H. E. Foreman, managing director, Associated General Contractors of America; R. O. Hunt, vice-president in charge of operations, Crown-Zellerbach Corporation; Edward L. Cushman, vice-president and director of Industrial Relations, American Motors Corporation; Ewan Clague, commissioner, Bureau of Labor Statistics, U. S. Department of Labor.

THE FIFTH PRESIDENT'S Conference on Occupational Safety will be held in Washington, May 14-16. The basic purpose of the conference is to save human life and limb and to further known accident prevention measures and safety education in the various industries and on the farms of America.

The program is being developed with the assistance of safety experts from industry, labor, government, and other fields. It will focus attention upon four areas

of safety: state occupational programs, community programs, public employees, and agricultural workers.

Mr. Eisenhower, members of his cabinet, and key people from industry and labor will participate as program speakers. Clinics will demonstrate successful techniques in special areas and blueprint a course of action which those attending the conference may take back to their states and committees to meet their own accident prevention problems.

ence and the Governor's Highway Safety Conference (Baker Hotel). J. O. Musick, general manager, Texas Safety Association, Inc., 830 Littlefield Bldg., Austin, Tex.

Mar. 28-29, Indianapolis

Ninth Central Indiana Safety Conference and Exhibit (Claypool Hotel). Jack Gunnell, director, Indianapolis Safety Council, c/o Chamber of Commerce, 320 N. Meridian St., Indianapolis 11, Ind.

Apr. 5-7, Klamath Falls, Ore.

Forest Products Safety Conference. Charles Houston, personnel

manager, Weyerhaeuser Timber Company, Klamath Falls, Ore.

Apr. 9-10, Toronto, Ont.

Industrial Accident Prevention Associations Annual Conference (Royal York Hotel). R. G. D. Anderson, general manager, 90 Harbour St., Toronto 1, Ont.

Apr. 10-11, Fort Wayne, Ind.

Thirteenth Annual Northeastern Indiana Safety Conference and Exposition (Chamber of Commerce Building). Sponsored by the Industrial Safety Committee of the Fort Wayne Safety Council. Ivan A. Mar-

NEW EYE SAVERS

FULL VISION SAFETY LENS WELDING GOGGLES



MODEL 490 G4



**Designed for Safety, Comfort,
Better Vision and Economy . . .**

Safe, Shatter-proof Lens Easily Replaced — Does not pit . . .



Eye Savers Lenses will not shatter or splinter with impact . . . will not pit. Lenses are easily replaced by removing the "lock bar" that positively locks the lens in the frame. No special tools needed.

Safer, More Comfortable Frame — Easy To Wear . . .

Eye Savers soft vinyl frames form-fit any shape face comfortably. Flanged nose bridge fills the gaps around the nose to assure greater protection. Adjustable, elastic headband holds goggles in position.



Full Vision Lens — Large Frame . . .

Extra wide 6" lens in the large vinyl frame provides ample space for metal or horn rimmed glasses. Frame forms a bumper that prevents the lens surface from touching when goggle is laid flat on a table or bench.

Stac-Vent Reduces Fogging . . .

A new principle in goggle ventilation, Stac-Vent, proven to provide clearer fog-free vision, more comfort and greater safety. MODEL 440 clear frame and MODEL 460 Transparent Green Frame Goggles available with Clear or Green Lenses.

MODEL 492 available with lens holder and 50 mm Federal Specification glass welding filters — No's 3, 4, 5, 6

See your Authorized Eye Savers Supplier, or write direct for full information on the New Welding Goggle and other Eye Savers.

Soft Vinyl Frame form-fits face for greater comfort, better protection.

FULL VISION METHACRYLATE LENS WITH NEW COLORANT FORMULA

Provides new high percentage absorption of harmful ultraviolet and infra-red rays for protection against glare of acetylene cutting and welding and for stand-by in arc areas. Smokey green colors, in various densities, scientifically developed to provide maximum view of working details. Available in Light Green (G2), Medium Green (G4) and Dark Green (G6).

NOTE: Does not meet Federal Specifications for glass filters.

ALMOST 100% PROTECTION with VISOR-TUC EYE SAVERS



MODEL 422 G4FC

Almost 100% protection in a lightweight, comfortable spectacle with over-eyes visor protection and semi-cup side shield protection. Furnished with medium green (G4) or dark green (G6) methacrylate lenses.

Ideal for wearing under welding helmet and for working in welding areas. Replaceable lenses snap-in-out; Retrax temple telescopes to perfect fit and easy comfort. Visor-Tucs weigh slightly over an ounce.

Quality Eye Protective Equipment

Made by the Leaders in Plastics



WATCHMOCKET OPTICAL CO., INC.

232 West Exchange St., PROVIDENCE 3, R. I. In Canada: Levitt-Safety Limited, Toronto 10, Montreal 26

National Safety News, February, 1956

tin, manager, Fort Wayne Safety Council, Chamber of Commerce of Fort Wayne, Fort Wayne 2, Ind.

Apr. 10-12, St. Louis, Mo.

Central States Safety Conference (Hotel Chase). Reyburn Hoffman, secretary-manager, The Safety Council of Greater St. Louis, 511 Locust St., St. Louis, Mo.

Apr. 10-12, Pittsburgh, Pa.

Western Pennsylvania Safety Council, Inc. Spring Conference (Hotel William Penn). R. S. Poister, general chairman, Western Pennsylvania Safety Council, Inc., 605 Park Bldg., Pittsburgh 22, Pa.

Apr. 16-20, New York

Twenty-sixth Annual Greater New York Safety Convention and Exposition (Hotel Statler). Paul F. Stricker, executive vice-president, Greater New York Safety Council, 60 E. 42nd St., New York 17.

Apr. 17-19, Cincinnati, Ohio

Twenty-sixth All Ohio Safety Congress and Exhibit (Netherland Plaza Hotel). A. W. Moon, congress manager, The Industrial Commission of Ohio, Columbus 15, Ohio.

Apr. 30-May 4, Battle Creek, Mich.

Second Federal Civil Defense Administration Staff College Course for Industry Defense (FCDA National Headquarters). W. Gayle Starnes, director, Staff College Federal Civil Defense Administration, Battle Creek, Mich.

May 2-4, Charlotte, N.C.

Twenty-sixth Annual North Carolina Statewide Industrial Safety Conference (Charlotte Hotel). H. S. Baucom, director of safety, North Carolina Industrial Commission, Raleigh, N.C.

May 7-9, Allentown, Bethlehem, Easton, Pa.

Twenty-ninth Annual Eastern Pennsylvania Safety Conference. Harold A. Seward, secretary-treasurer, Lehigh Valley Safety Council, 602 E. Third St., Bethlehem, Pa.

May 10-11, Baltimore, Md.

Governor's Safety-Health Conference and Exhibit (Lord Baltimore Hotel). Joseph A. Haller, executive director, Department of Labor and Industry, State of Maryland, 12 East Mulberry St., Baltimore 2, Md.

May 14-16, Washington, D. C.

Fifth President's Conference on Occupational Safety. Paul E. Gurske, director, Bureau of Labor Standards, U. S. Department of Labor, Washington 25, D. C.

May 22-24, Rochester, N.Y.

First Genesee Valley Safety Conference and Exposition. Sponsored by Rochester Safety Council; Genesee Valley Chapter, ASSE, and Industrial Management Council of Rochester. William H. Keeler, secretary-treasurer, Genesee Valley Safety Conference, Inc., 55 St. Paul St., Rochester 4, N.Y.

June 5-6, Hartford, Conn.

Eleventh Annual Conference of the Connecticut Safety Society (Hotel Statler). Stephen J. Pollock, Jr., manager, c/o Remington Arms Co., Inc., 939 Barnum Ave., Bridgeport, Conn.

Sept. 13-14, York Harbor, Me.

Twenty-ninth Annual Maine State Safety Conference (Marshall House). Arthur F. Minchin, secretary, Department of Labor and Industry, State House, Augusta, Me.

Oct. 22-26, Chicago

Forty-fourth National Safety Congress and Exposition (Conrad Hilton Hotel). R. L. Forney, secretary, National Safety Council, 425 N. Michigan Ave., Chicago 11.

Wisconsin Conferences

March 21—Canners' Safety Institute, Madison.

April 13—Foreman's Safety School, Milwaukee.

April 19—Southwest Regional, Richland Center.

May 10—Fox River Valley and Lakeshore, Appleton.

May 11—Foreman's Safety School, Milwaukee.

May 17—Rock River Valley Safety Conference, Beloit.

May 24—Southeast Lakeshore, Burlington.

June 1—Foreman's Safety School, Milwaukee.

June 8—Northwest Regional, Ashland.

June 12—Wisconsin River Valley, Merrill.

For information about Wisconsin Conferences and safety schools write R. W. Gillette, executive secretary-treasurer, Wisconsin Council of Safety, 1 W. Wilson St., Madison 2, Wis.

New Incandescent Lamps To Give More Light

DEVELOPMENTS in incandescent lamps now being placed in effect will cause increases in light output ranging from six per cent for household bulbs to 15 per cent for higher wattage bulbs used in industrial and commercial lighting, General Electric announces. No more electricity is required.

Herman L. Weiss, general manager of G-E's Large Lamp Department, has announced the immediate availability of the improved lamp in the 750- and 1000-watt sizes, which offer the greatest benefits. The new developments will be extended to other sizes within the next few years, as rapidly as equipment can be built and installed to mass produce the hundreds of millions of bulbs used annually.

Vernet C. Kauffman, department manager of engineering, said the increased light output is achieved by the following steps:

—Improving the tungsten filament by making basic design changes;

—Altering the mount structure, so that the filament is positioned lengthwise, or axially, in the bulb; and

—Substituting for the first time coiled-coil filaments for singly coiled ones in lamps of 300 watts and larger.

As a result of these construction changes, lamps of 300 watts or larger will have an increased light output over their lifetime of 15 per cent. The improved 750-watt bulb, for example, will produce an average of 21.6 lumens, or units of light, per watt of electricity consumed. This compares



"I finally have that new hammer you requested—too late!"



For skidproofing, sprinkle ZORBALL freely on icy, wet walks, drives, etc.—or spread on floors to absorb oil, grease, paint, chemicals.

Wyandotte ZORBALL underfoot makes icy areas safe!

Eliminate the danger of slipping to both workers and vehicles this winter, with skidproof Wyandotte ZORBALL! A thin layer of ZORBALL on icy walks, platforms, loading and shipping docks, ramps, and driveways will prevent accidents and work delays. And ZORBALL won't cake, mud, dirt, or track!

All-purpose ZORBALL is the safest floor absorbent you can buy! It has no effect on fabric, wool, metal, rubber, or skin . . . absorbs water, paint, oil, grease—any liquid—and it is *fireproof*, even when saturated with combustible liquids. Use it indoors or outdoors . . . on any type surface.

You'll save, too, with ZORBALL's low use-cost, resulting from a greater resistance to breakdown than any other floor absorbent!

Try a free sample, now! Mail coupon at right, today, or call your Wyandotte representative or jobber. *Wyandotte Chemicals Corp., Wyandotte, Michigan. Also Los Nietos, Calif.*



Helpful service representatives in 138 cities in the U.S. and Canada

Largest manufacturer of specialized cleaning products for business and industry

MAIL COUPON TODAY FOR FREE SAMPLE

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Wyandotte, Michigan**

- ☐ Send free sample of ZORBALL
☐ Have representative call

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Street

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with an efficiency of 18.9 lumens per watt for present 750-watt bulbs.

In the case of household sizes, which already have the benefits of coiled-coil filaments, the light output increase will amount to at least six per cent.

Axial positioning of the improved filament, the most dramatic visual change in the improved lamps, does two things to increase light output, Kauffman explained.

—It permits the filament to burn at higher temperatures without shortening its operating life. The hotter a filament burns, the more light it produces.

—It causes bulb blackening to concentrate in a smaller area, and thus permits more light to get out.

Guards Increase Handsaw Production

BY STRICTLY enforcing a safety rule, a construction firm proves that guards on power handsaws provide not only safety, but efficiency as well.

The Grandview Building Company of Beverly Hills, Calif., builders of more than 3,000 homes in the Burbank area, were concerned some time ago with the fact that many carpenters operated power handsaws with the guard blocked or wired out of the way.

To meet this problem the company (which owns about 400 power handsaws) issued a strict warning—immediate dismissal of any worker operating a power handsaw with a guard not in place. The warning was attached to pay checks.

The company received many objections to its ruling, and lost some good men who disregarded the warning. But the company stuck to its policy.

One of their best rafter cutters claimed that the use of a guard would cut his production in half, but he was told to use it despite any loss in production. Within three days, his production was again at a peak, and he was operating the saw not only with efficiency but with safety.

The company's ruling has now been in effect three years, and

Hotel Sponsors Children's Panel



AN UNUSUAL SAFETY IDEA was put into effect recently by the Sherman Hotel, Chicago, when Maurice Martel, the hotel's director of safety (center), called a meeting of employees' children to discuss accident prevention both at home and on the job.

Here, the youthful panel holds a meeting with the slogan, "Work safely, Dad, we're counting on you."

At left, and at extreme right, are Helen Barrett Humphrey and William V. Humphrey, Jr., children of William V. Humphrey, director of public relations; second from left is Ellis James Di Cosola, son of Carmen Di Cosola, electrician; on right of Mr. Martel is Walter Lee Baulice, whose mother, Mattie, works in the Sherman's laundry.

The event was a great success and parents and hotel officials agreed that the children managed to get across the idea of "Safety Pays."

according to the firm's general superintendent, John F. Meredith, *production has actually increased.*

He takes issue with those who say that carpenters will not work with a guard in its normal operating position.

"Manufacturers of portable equipment are doing a wonderful job to make their products safe," he says. "If builders will do their part by educating workmen and maintaining equipment, injuries will be reduced to a minimum."

California Safety News

Blames Emotions for Most Job Accidents

MOST ACCIDENTS in industry occur when workers are in a low emotional state, according to a

study made by Dr. Rexford Hersey, association professor of industry at the University of Pennsylvania.

The study made by Dr. Hersey, an industrial psychologist, involved the analysis of more than 800 accidents.

Its results are revealed in *Zest for Work*, a book published upon his completion of a long-range study of various factors which influence the productivity, safety and loyalty of workers.

"Although emotional lows, both cyclical and incidental, can be expected to cover less than 20 per cent of the average worker's 35-day emotional cycle, almost 60 per cent of the accidents occurred during these low periods," Dr. Hersey reported.

"An additional 20 per cent were recorded when the workers were experiencing high cyclical



Why many shops prefer braided slings

In the view of experienced shop men, heavy, cumbersome loads are often handled most easily with braided slings. The lift shown above is a good example.

That huge rough forging weighs many tons. Two large Bethlehem slings, eight-part-braided, were selected for the lift. Note how sturdy they are. Note the diameters. Yet, in spite of their size, they are flexible. Only a flexible sling could hug the contours of the load and hook so well.

This is a combination you'll always find in Bethlehem braided slings. Very high strength, together with pleasing flexibility that makes handling quick and easy.

There are no finer braided slings on the market.

They are made painstakingly, step by careful step. But the same is true of every Bethlehem sling, no matter what the type. Whether your needs call for braided or single-part slings, or for grommets, bridles, or any other kind, you can rely completely on Bethlehem workmanship.

If the choice of slings should ever become a problem, ask a Bethlehem man to pay you a visit. You'll find that he knows shop practice, and his experience with lifts of all types can prove helpful to you. Feel free to request his services.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation.
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BETHLEHEM STEEL



periods, while the remainder occurred during periods classified as neither abnormally high nor low."

The incidence of accidents during the emotional highs was attributed by Dr. Hersey to two factors.

When the elation and physical vigor become too high, he pointed out, the possibility of accidents fades into insignificance in the worker's mind and tends to make him careless.

Further, such a period of elation often stimulates him to speed up production to an extent that is incompatible with the observance of ordinary safety precautions.

On the basis of his findings, Dr. Hersey urges that more attention be paid to the emotional state and day-to-day adjustment of the individual worker as a "most vital" aspect of accident prevention.

"The better adjusted and interested the worker is in his total environment, both plant and home, the better able he is to control his lows, whether cyclically or environmentally caused," he stated.

"However, even the best adjusted worker will likely have his times of crisis, which the foreman should be alert to detect and, if possible, direct into harmless channels.

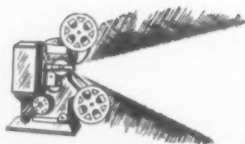
"Such an approach fosters a situation in which true employee-management cooperation tends to thrive naturally."

13th Annual Safety Film Contest Opens

ENTRIES are being received for the 1956 contest of the National Committee on Films for Safety. This 13th annual competition includes motion pictures and sound-slide films produced or released during 1955 in the fields of occupational, home, traffic and transportation, and general safety.

There is no charge for entering the contest, nor for awards to sponsors of winning films. For entry blanks or further information, contact William Englander, secretary, National Committee on Films for Safety, 425 N. Michigan Ave., 5th floor, Chicago 11.

Deadline for contest entries is February 27, 1956.



SAFETY FILMS

For further information on publications or films listed here, write Nancy Lou Blitzen, Film Consultant, Membership Service Bureau, National Safety Council

Health, Hygiene and First Aid

A Plant Health Program (35mm sound slidefilm) black & white. 14 minutes. Produced in 1955.

This filmstrip tells the story behind employee health services by showing how such a service operates in a printing plant in Louisville, Ky. It helps answer such questions as: Why are employee health programs being established? What services do they provide? What do they accomplish?

The program shown is a two-point one: engineering control and medical department. Engineering control eliminates hazards in plant operations and the medical department insures the workers constant good health plus prompt treatment of injuries sustained on the job. The program pays off in reduction of accidents, lowering of workmen's compensation rate, and sharp drop in absenteeism.

Film can be shown to management, workers, and those in the health professions.

Prints are available on a loan basis from state health departments and for purchase from United World Films, Inc., 1445 Park Ave., New York 29. It was prepared by the Public Health Service, U. S. Department of Health, Education and Welfare.

Logging

A series of four 16mm sound motion pictures in color have been released by the British Columbia Lumber Manufacturers' Association. All carry the title, *Assignment Safety*, and are numbered for reference. The over-all story covers the experience of a reporter assigned to cover a visit of Ned Dearborn, president of the National Safety Council, inspecting and discussing safety practices as seen in the association mills.

Assignment Safety, Part I

shows the safety ideas and practices in the process from the log pond to the sorting chain, plus the machines and methods in the mills which convert logs into rough lumber.

Assignment Safety, Part II follows the remanufacturing of the rough lumber throughout drying and planing process to storage yards and shipping docks. Some extremely interesting and, in some cases, novel safety devices are pictured.

Assignment Safety, Part III shows safe work methods practiced by those responsible for mechanical operation and maintenance of a mill. Operations ranging from material handling to welding, linemen to blacksmiths, pouring hot metal to sharpening saws, and others are all pictured.

Assignment Safety, Part IV tells the story of the accident prevention program which emanates from the safety committee of the association to all member firms. It shows the functioning of the association safety department, the training programs, special safety drives, plant safety committee, induction and training of new employees, and the incentive programs.

Each of these films runs about 18 minutes and may be shown alone or with the other films as a series. Information on availability can be obtained by writing the British Columbia Lumber Manufacturers' Association, attention senior safety director, 550 Burrard St., Vancouver 1, B. C. The films are cleared for TV.

A definition of "tears:" The hydraulic force through which masculine will power is defeated by feminine water power.

You should have two aims—to make a little money first, then make a little money last.—*TitBits*



B R E C K

p H 7 P R O T E C T I V E C R E A M

Breck pH7 Protective Cream covers the skin with an invisible, oil-resistant film which is neither slippery nor sticky. This neutral film prevents contact of irritants with the skin. Breck pH7 Protective Cream is effective against such irritants as lubricating oils, grease, aromatic and hydrocarbon solvents, cutting compounds, synthetic resins, rubber dust, fiber glass, paint, duplicating inks and iron dust. Breck pH7 Protective Cream is easily removed with Breck Hand Cleaner or with soap and water, making the use of harsh cleansers unnecessary.

A Breck Industrial Preparations Booklet will be forwarded to you upon request.

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Hitting Your Safety Stride

In sport, performance depends on the player's rhythm and timing—on his stride. On many jobs getting into the proper stride aids safety and efficiency. Here's how a foreman can help a worker develop it

By JOHN BECK

THE definition of stride is a definite cycle of movements, a definite pattern of doing things each time we do it.

A machine such as an automatic metal stamping machine must follow a definite cycle of movements and is held between close clearances by bearings, shafting and linkages. If a piece of sheet metal is placed in the machine, an arm comes down and shapes or punches holes in it and ejects it from the machine.

This machine will run through hundreds of operations without a single accident, because it has a definite cycle of movements. We can say it has a certain stride. If the person operating this machine is not hitting his stride, he will make the wrong move which might result in a serious accident.

In sports, the professional has a stride; if he is a golfer, bowler, or a ball player he has a definite stride. If he is off his stride, it may make the difference between success and failure.

A bowler, as he becomes skilled, follows a certain cycle of movements or we say he is on his stride. He stands at the end of the alley with the ball in his hand, carefully gauging the distance from where he will deliver the ball. He always steps off with the same foot, taking the same number of steps forward and delivers with the same rhythm each time.

I have in mind a friend—an engineer with our company. Everything he does follows the same cycle of movements. I have noticed him when he is driving his

car. He gets into the car, carefully arranges his coat, pulls up his pants legs, reaches into his coat pocket, gets out a cigar and lights it up, pulls out an ash tray from the dashboard, and starts the motor.

In contrast, he might jump into the car and after he started down the road he might squirm in his seat from one side to the other, re-arranging his coat and pants legs; in all this time driving with part of his attention on driving and the other part on his other actions. After several miles he would hunt through his pockets for a cigar and some matches.

Have you ever seen a horse-pulling contest where they hitch a team of horses to a sled loaded with cement blocks and keep loading it until the horses can't pull it? A winner always handles his horses with a certain stride. He understands his team, has them lean forward until they get the feel of the load, gradually throwing their weight on the collar and at a definite time he gives them the signal to move forward. A good driver never throws his horses off their stride.

A good workman works with a certain stride or cycle of movements. I feel this is one of the differences between a safe workman and an accident-prone workman. This stride, as we call it, comes partly with experience but some workmen never hit a stride. They are what I call grabby workmen. They are first grabbing for this, throwing it down and then grabbing for something else, about half the time doing the right thing and the other half doing the wrong thing.

When I first worked as an elec-

trician, I found some days everything would go along like clockwork, and then other days everything I would do seemed to be the wrong thing. At one time I was working with an electrician of many years' experience and several years older than myself. One day when everything seemed to be going wrong, he said to me, "Let's take a walk, I am completely off my stride." After taking a short walk and coming back to the job everything seemed to work better. That is when I realized what it was that made things go along better some days than others.

A foreman or supervisor can keep his men on their stride or he can keep throwing them off their stride, just the same as the driver of the team of horses in the pulling contest.

Here are several ways a foreman or supervisor can throw a workman off his stride:

1. Stand over him and watch every movement he makes.
2. Keep talking to him and giving instructions while he is trying to do the job.
3. Continually cautioning and giving safety instructions while the workman is doing the job.

Here are several ways a foreman or supervisor can help a workman to hit his stride:

1. Instruct the workman about the hazards of the job before he starts. If necessary, call him to the side and give him detailed instructions. Write it down for him to read before doing the job. Illustrate by pencil sketches or go over a blueprint with him.
2. Then let him do the job without interference.

JOHN BECK is an Electrical Engineer with the Firestone Tire & Rubber Company, Akron, Ohio.

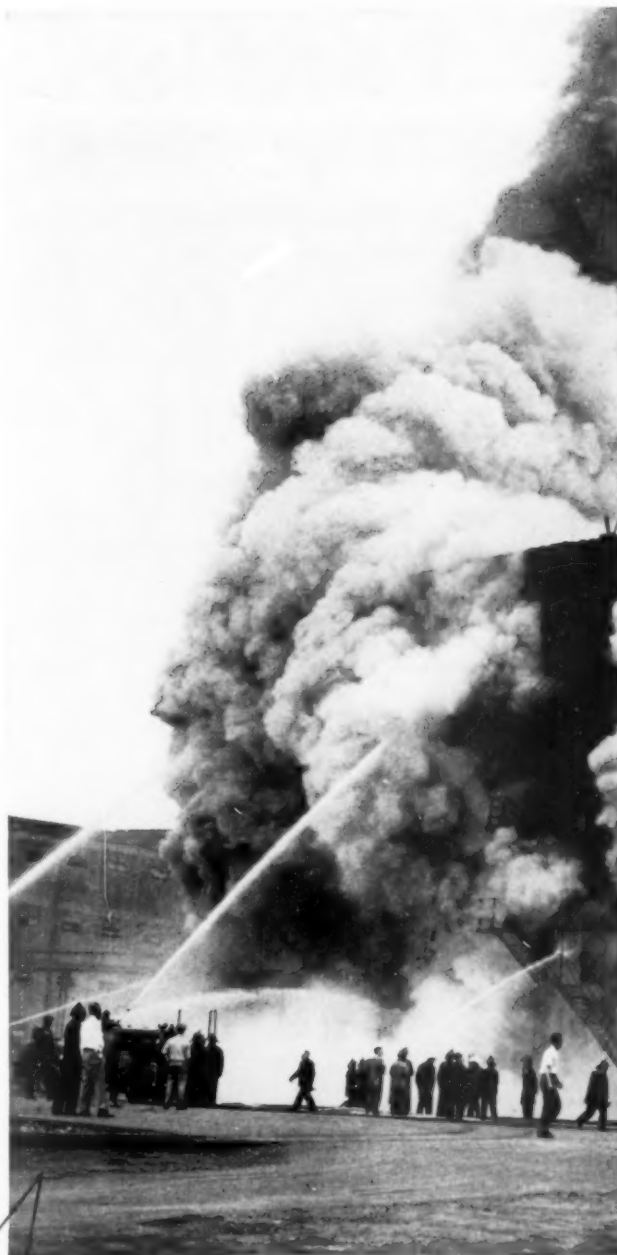


use only
Ampco* Safety Tools
for any job
where fire can occur

When employees must work under unsafe conditions, they tend to do "hurry-up" jobs. That's why you're money ahead when you insist that they use only Ampco Safety Tools in any location where a dangerous hot spark could touch off an inferno.

Ampco Safety Tools are approved by Factory Mutual Laboratories and other safety authorities, for use wherever there are dangerous, inflammable liquids, gases, dusts, or vapors — wherever one slip of a tool could start a disaster.

Play it safe. Select your safety tools from the Ampco line — the world's largest with more than 400 items. Order Ampco today for all your hazardous jobs.

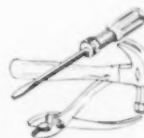


How to choose Safety Tools



For tools subject to impact and/or torque — specify Ampco Metal.

For tools that have cutting edges or gripping teeth — specify Ampco Beryllium Copper Tools.



For tools to be used in the vicinity of acetylene or similar gases — Specify Ampco Monel† Tools.

†T. M. International Nickel Co.



AMPCO METAL, INC.

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In Canada . . .
It's Safety Supply Co.,
Toronto, Ontario

*Reg. U. S. Pat. Off.

T-16

Portable Workstands

Portable workstands include everything from empty nail kegs to well-built ladders and scaffolds. No industry knows the value of good equipment better than the airlines

By R. L. POTTER

SUCH ORGANIZATIONS as the American Standards Association, Metal Ladder Manufacturers Association, the Association

R. L. POTTER is Supervisor, Industrial Safety, American Airlines, Inc., Tulsa, Okla. This article has been condensed from a paper presented at the 43rd National Safety Congress.

of Casualty and Surety Companies, National Safety Council, and others have done a wonderful job of providing ladder standards. Their specifications are good.

Manufacturers of ladders are cognizant of our problems and are building safety into their products as prime selling points. In other words, it isn't too difficult to buy

a good ladder that is suitable for most jobs.

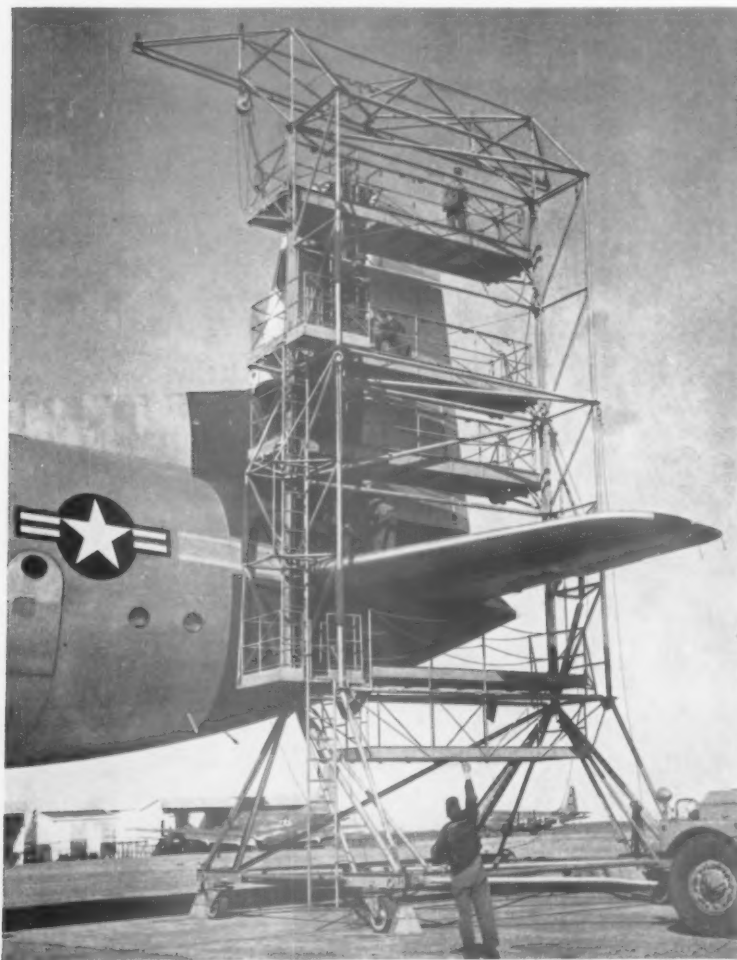
If you have a specialized problem where ladders are not the answer, portable workstands which comply with recognized standards are used. But regardless of how much care is used in the selection of ladders and portable workstands, we will continue to have accidents if:

- They are not used for their intended purpose.
- They are used improperly.
- They are not properly maintained.

We have closely analyzed several hundred fall incidents where portable workstands and ladders were involved and failed to find a single instance where good, properly used, properly maintained equipment was the cause.

The term "portable workstands" can cover a multitude of neck breakers. If a man has a quick job just out of reach from floor level, he is likely to use the nearest and handiest object that will provide the desired elevation. Those who are in the construction industry will readily think of nail kegs and dynamite boxes in this regard. Those two demons, particularly the former, caused me endless worry during the ten years I spent in construction safety.

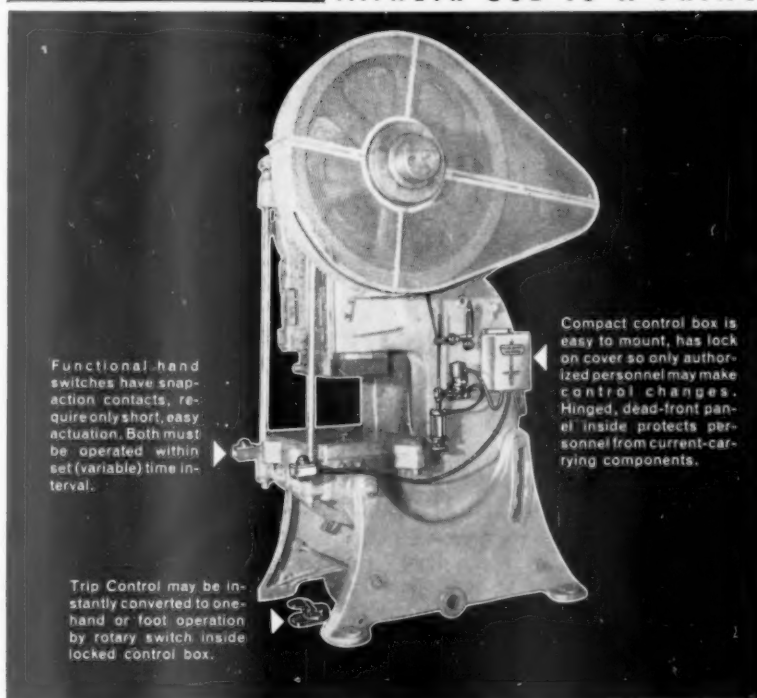
There was one incident I will never forget. It was during the war, on one of the large government contracts. We had an iron-



The increasing size of planes, both civilian and military has led to the development of a variety of portable workstands. (U. S. Air Force photo)

MICRO precision switches

...THEIR USE IS A PRINCIPLE OF GOOD DESIGN



Functional hand switches have snap-action contacts, require only short, easy actuation. Both must be operated within set (variable) time interval.

Compact control box is easy to mount, has lock on cover so only authorized personnel may make control changes. Hinged, dead-front panel inside protects personnel from current-carrying components.

Trip Control may be instantly converted to one-hand or foot operation by rotary switch inside locked control box.

Increase production...3 ways... with MICRO SWITCH Trip Controls

MICRO SWITCH Trip Control will speed production and provide safety to the operator and equipment on any power machine that will lend itself to two-hand control.

1 Less operator fatigue: Simple direct operating motions, feather-touch finger-tip operation of the control switches, and the absence of gates, harnesses or sweeps keep the operator fresh and alert.

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3 Instantaneous electrical actuation of the clutch: Saves time on every operation.

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Reduces chance of accidental operation. Operation can result only when control system is functioning properly. The control becomes inoperable if a component fails.

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Interlock prevents accidental power stroke during set-up. Operators, set-up men, and expensive dies are protected during set-up. The interlock prevents an unexpected stroke when the motor is started up again.

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These controls offer a choice of desirable single-stroke control for positive mechanical clutch machines and automatic cycling control for friction clutches and hydraulic and pneumatic equipment.

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Provides fast, safe, effortless operation of small two-hand presses, riveting machines, etc.

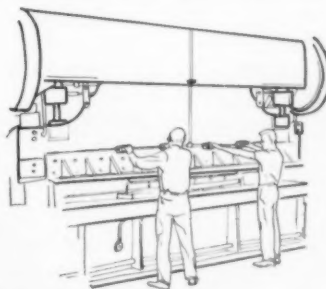


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Where one hand is required to hold stock in a protected or enclosed die, control is quickly converted to one-hand operation.

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clad rule that nail kegs were to be demolished when empty. But, like so many other such rules, there was the occasional slip in its enforcement and eventually (usually sooner) a fall resulted.

I was driving down a road one morning and saw a carpenter standing on a nail keg while nailing a scaffold member to the side of a building. Immediate corrective action was in order, but I was in a hurry and did not stop. A few minutes later that carpenter was on his way to the hospital with a broken pelvis.

He later told me that he hadn't wanted to waste the time getting a ladder to do a job which would only take a minute. I think the man was conscientiously trying to save time. He had not, however, been properly educated in safe practices. And there is something you might say about his supervision.

If we are to prevent falls, or any other type of accident, we can do so only with intelligent first line supervision. Getting these people interested in accident prevention is one thing, educating them to the point where they can prevent accidents is another. Here is an example:

Several years ago on a construction job, we had a very reckless individual employed as a carpenter foreman. He was an excellent mechanic but lacked supervisory experience. The result was submarginal work, and accidents involving members of his crew were frequent.

I spent a lot of time with this fellow, and, in time, he became enthusiastically persistent in his efforts to prevent accidents. He insisted upon the use of personal protective equipment; he urged his men to purchase safety shoes. These were the superficial aspects of the safety program that were within the scope of his capabilities.

One morning I got a call from the dispensary and was advised that one of his men had suffered a broken leg. Immediate investigation of the incident disclosed a perfect example where a supervisor's enthusiasm to do the correct thing, minus technical knowledge, equals disaster.

The injured man had been de-



Sectional ladder scaffolds are widely used in industry for maintenance and repair work. This basic unit consists of 6 ft. 1 in. ladder sections, floor section, diagonal braces, horizontal brace and casters. (Patent Scaffolding Co.)

scending a ladder into a 12-foot pit in which concrete forms were being placed. The ladder, complete with hand rails, was set at a 45° angle. The foreman was very proud of the ladder, pointing out to me the added safety of the hand rails. The results, of course, were obvious. Everyone used the ladder as they would normally use stairs. It was in use less than two hours when the accident occurred.

This was a case of a man who had a "smattering of ignorance" about accident prevention. He was sincere in his determination. He had heard a talk at a safety meeting on requirements for handrails on scaffolds, stairs and platforms. Why not put hand rails on the ladder, he thought. Wouldn't that make it safer? No one had taken time to teach him the basic difference between stairs and ladders, or the critical angles of each.

Similar incidents were commonplace during the wartime building emergency when good supervisory talent was spread too thin. Those of us in rapidly expanding industries today are facing similar problems. Promotions into the supervisory ranks are faster than men can be trained to assume the responsibilities.

Our foremen training must be intensified and it is our job to see to it that accident prevention is a part of such a program.

If the foreman observes improper use of any type of equipment, he should tell the offender

as quickly as possible. If he sees or is told that a piece of equipment is in need of repair, he should remove it from service at once and have it repaired. Those are cardinal points in our program, and the foremen who practice them spend little time writing accident reports.

In aircraft maintenance and operation, we have multitudes of ladder and workstand problems involving a great variety of specialized equipment.

A tremendous amount of our maintenance work is done from portable stands and ladders and it takes a variety of such equipment to service a four-engine aircraft which requires service checks from floor level to the top of the vertical stabilizer—30 feet up.

The presence of various types and sizes of stands presents problems. It leads to misuse. In other words, stands of insufficient height are sometimes used when it seems inconvenient to walk a short distance to get the proper size.

Even with our high exposure to the hazards, only two per cent of our reportable injuries during the past two years were due to slips and falls from portable stands and ladders. We feel that this is a fine record, although we know that just a little extra effort would have made it near perfect. I say "near perfect" because these two factors are against us in the battle against falls:

Gravity—Falling is simple because it is given a big assist by one of nature's constant laws. Gravity is a strong thing. It is constant. Most other types of accident situations require greater contributions from the participants than shifting one's center of gravity a fraction of an inch too far in the critical direction.

Physiological Factor—Some individuals have near-perfect equilibrium. Others lack it to the extent that they have difficulty in walking a straight line, even without benefit of stimulants. Athletic coaches will tell you that good balance is a prime requisite for superior athletic ability. This is also true of aircraft pilots. There is little question that the same rule would hold true in any activity which requires muscular co-

—To page 142

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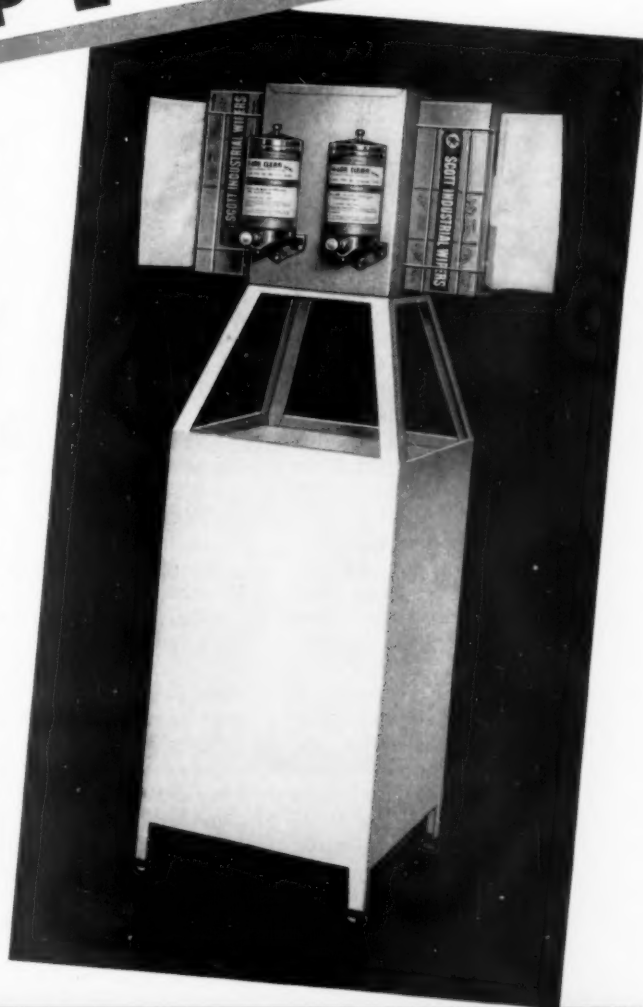
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Who Are the 'Accident Prone?'

They form a constantly shifting group; they're fewer than you think, and you can't always identify them

By RICHARD KAYWOOD, Ed.D.

THE concept of accident proneness has occupied an increasingly important position in the minds of safety engineers, industrial management, public officials, and psychologists as a critical element in the total accident problem ever since Greenwood and Woods in 1919 "compared the distribution of accidents in a given population with a simple chance distribution for the same number of accidents in a population of the same size"¹ and found that more people had no accidents than might have been expected "by chance," and that more had many accidents than might have been expected "by chance." The essential feature of the principle of accident proneness lay in the difference between actual accident records and chance expectance.

Since then other investigators have emphasized the nature of accident proneness in studies which demonstrated that large percentages of accidents involved small groups of people. Differences in job hazards did not explain differences in accident liabilities; the same people in different jobs maintained significant correlations in accident experience. Public acceptance of the accident-prone concept has reached the stage where any attack on the accident problem is spearheaded by intensive activity directed at the accident prone, in the secure belief that with this small group lies the basic solution.

A recent report by Dr. Schulzinger supports this view in part,

RICHARD KAYWOOD, Ed. D., is Executive Director, Santa Barbara Safety Council, and an industrial safety consultant.

and introduces an interesting variation to the concept.² From his study of 27,000 industrial and 8,000 non-industrial accidents which he treated over a 20-year period, Dr. Schulzinger concluded that the comparatively small proportion of the population responsible for a large majority of the accidents represented "essentially a changing group, with new persons constantly falling in and out of the group."

Accidents appeared characteristic of youth; people under 35 years old had 75 per cent of the accidents in this study, with the peak age at 21. This association of accident involvement and youth suggested that the accident-prone group did not remain constant, but continued to admit younger members as older ones became safer (or were killed or otherwise incapacitated).

Mintz and Blum cast serious doubt on the size of this accident-prone group, basing their conclusions on the fact that chance expectations do not require all people to have the same number of accidents.³ Some will have two, three, or four accidents in a chance distribution before others have even one. Thus, they argued, individuals with many accidents may not be any more accident prone than the average. With this in mind, an examination of accident distribution found in practice did not reveal great differences from the probability curve expected. Differences between the two might be caused by "chance" factors as well as by a predisposition to accidents.

A more accurate statistical method suggested by these two authors to determine the extent of

accident proneness in a given accident distribution indicates a much smaller percentage of persons in the distribution as accident prone than previously estimated. The evidence in this study points to accident proneness as a relatively less important factor in accident liability. Statistical methods used by Mintz and Blum have been challenged by Maritz⁴ and refuted by the first two.⁴

Until these differences regarding statistical approaches to the problem have been definitely resolved it would be well to defer final judgment and consider all views as tentative.

Such evidence raises several interesting issues. First, if the accident prone constitute a small, constantly shifting group, what can be done to distinguish these individuals from others so that preventive measures may be taken. Second, if accident proneness is not a key factor in accident liability, how and where should safety engineers, psychologists, and others direct their attention in attacking the accident problem?

With respect to the first question, there seems to be a sharp difference of opinion. Harris, in a study of two groups of 25 industrial workers carefully matched in practically all characteristics except accident frequency, found "... no significant differences ... between the groups in response to the test items" in a number of personality tests.⁵

Tillmann and Hobbs, on the other hand, showed a high correlation between accident liability and specific personality characteristics in a study of bus drivers.

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Tuffy SLING NEWS



Vol. 1

Published Monthly in Leading American Trade Magazines by Union Wire Rope Corp.

No. 3

NEW FERRULE EYE SPLICE FEATURED In Big, New Tuffy Sling Handbook Just Off Press-FREE



First editions of this handbook were so popular that 85,000 copies circulated to sling users. If you use or buy slings—if you're a plant engineer, safety engineer or purchasing agent—you'll find this new, enlarged edition of the Tuffy Sling Handbook the most comprehensive ever published.

It tells you all about the new factory-fitted slings added to the Tuffy line. It shows why the new Tuffy pressed-on ferrule makes Tuffy slings faster, safer, and easier to load and unload than ever before. Many of the fittings—clamps, hooks, bridles, thimbles, saddles—are new, too. And this latest edition of the Tuffy Sling Handbook contains a host of other useful information: a complete rigger's manual, proof tested ratings and specifications for all Tuffy Slings; a new engineer's notebook; data tables on a full line of versatile, easy-to-apply sling fittings.

But don't delay to order your **FREE** copy. Mail the coupon to us now. We'll send it to you by return mail with Tuffy's compliments—nothing to buy, no obligation. Hurry. The supply is limited!

New Tuffy Ferrule Makes Sling History

It's on all Tuffy Slings, but it doesn't cost you a penny extra. There's no sling ferrule like it anywhere. Tuffy's streamlined metal ferrule is set on the eye splice under pressure so great that the inner metal virtually flows into the voids between the wire fabric. A force of friction is created so great that the eye splice has strength equal to that of the famous machine braided Tuffy wire fabric. It makes Tuffy Slings stronger. It makes them safer: The ends of the tapered ferrule are swaged tightly to the fabric leaving no edges to hang up on loads or to injure workers' hands in hitching to and unhitching from sling loads. There's still another advantage—because Tuffy Slings are easier and safer to load, they're also faster to load. Your men can do more work when they're working with Tuffy Slings.

New Tuffy Ferrule

has no sharp edges to injure hands or catch on loads. The tapered and rounded ends are swaged tight to the sling fabric. The tremendous pressure at which the ferrule is pressed around the machine braided wire fabric flows the metal into the voids of the eye splice and gives the eye splice 100 percent of the strength of the fabric.



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NSC Board Approves Expanded Program, Record Budget

Chicago recommended as permanent home of National Safety Congress; Women's Activities and Labor Conferences receive official status

By NORVAL BURCH

ORGANIZED safety recorded outstanding gains in 1955, with the National Safety Council reporting the greatest growth in recent years, and extended effort on every front during 1956 is evident.

That is the story reflected in the reports delivered to the Board of Directors of the National Safety Council at its December 13 meeting in the Biltmore Hotel in New York.

Similar optimism marked the reports and discussion of the NSC Industrial Conference. The Conference voted to recommend that Chicago be the permanent host city of the National Safety Congress.

Plans for expanded program activities by the Council in the year ahead were given the green light when the Board gave unanimous approval to the largest annual budget in National Safety Council history—a total of \$4,897,420. The detailed budget proposal worked out by NSC staff executives had been mailed to Board members two weeks earlier.

Two new program activity governing bodies were given official status when the Board approved initial members of the Women's Activities Conference and the Labor Conference. The roster of the former, headed by Vice-president Marion E. Martin, includes 10 members officially representing organizations and 19 others.

Labor's Point of View

In the absence of Vice-president Harry Read, P. L. Siemiller pre-

sented the Labor Conference slate, pointing out that the membership had been selected from labor representatives who attended the 1955 National Safety Congress. Reaffirming a statement by Mr. Read, when the latter was elected vice-president at the October Board meeting, Mr. Siemiller predicted the Labor Conference will be a working group in Council affairs, dedicated to the prevention of accidents among the members of organized labor.

"We will not permit Labor to inject its outside controversies or activities into National Safety Council affairs," he said. "Neither will we be hitchhikers in the safety movement. For we are determined to pay our own way through sincere effort to prevent accidents."

To bring National Safety Congress exhibit booth rates more nearly into line with rates charged by other organizations, the Board approved the recommendation of the Finance Committee to increase the charges an average of 33 per cent.

Personnel Plans

Improvements of the NSC staff salary plan will be the goal of a committee authorized by the Board to review the Council's present salary schedule. Board Chairman Clifton W. Phalen named E. F. duPont as chairman and George A. Jacoby and Robert T. Ross as members of the Salary Review Committee.

Air conditioning of National

Safety Council headquarters in Chicago, at a cost not to exceed \$150,000, was approved. E. J. Buhner, who presented the Finance Committee report, said the committee agreed with the belief of Maj. Gen. George C. Stewart, executive vice-president of the Council, that the expenditure would be a wise investment in terms of staff efficiency.

In his report to the Board, General Stewart recalled being asked to state his ideas of administration at the time of his selection more than a year ago.

"I replied, in substance," he said, "as follows:

"Personnel at every level are entitled to know in specific terms what they are expected to accomplish and what duties they are charged with. They are also entitled to guidance in keeping their activities within the framework of organization policies; the means to accomplish their work; authority commensurate with responsibility; and credit for their accomplishments.

"The achievement of objectives must be planned in terms of time and allocation of sub-tasks. There must be an arrangement for the coordination of the elements of the organization in order to insure that the sum of individual activities will add up to team effort directed at the purposes of the entire organization. There must be periodic reviews of progress, and adjustments to changing conditions."

"These remarks . . . having been favorably received, I believe it



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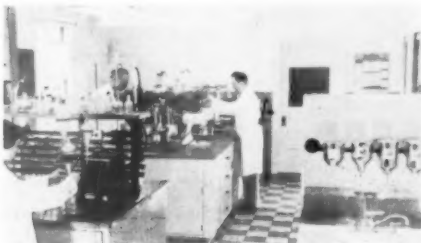
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of skin cleanser heralded as the first major soap development in a quarter of a century.

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SBS research developed SBS-60 after years of study. This new type of soap is proclaimed the successor to liquid and bar soaps.



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proper to point out that the Council is now operating in accord with these principles.

"Our organization book, a copy of which was given to each of you in June, prescribed objectives, listed duties and furnished guidance for every department of the Council. Reviews of progress and adjustments to changing conditions have been made during the year. Activities have been planned in terms of time and a coordinated allocation of tasks.

"Coordination is provided for in plans and checked in staff meetings. Teamwork is steadily improving and the weight and ability of the entire organization are mobilized to achieve each objective.

"The staff, supported by Council officials and members, has improved relations with local councils and there is promise of substantial growth in the number of local safety organizations.

"The staff has worked harmoniously and effectively with other organizations and, in a number of instances, has supplied the initiative and leadership.

"The program departments, that is those departments actually engaged in accident prevention work, have shown increased confidence and momentum. They are supporting and supplementing each other's efforts. They now have their production of materials planned for 12 months ahead, with check points for each stage of development. The coming year will show improvement in the effectiveness of our accident prevention work.

"As I understood the signals when I became general manager, they were, in football terms, to 'run with the ball.' That is what I have done. We have expanded our activities, increased our staff and raised the tempo of our work. However, we have lived within our income."

World-Wide Activities

President Ned H. Dearborn, reporting to the Board on his recent travels, which have included trips to the Orient, Alaska, Netherlands West Indies, and Venezuela, as well as many parts of continental United States, said he is impressed with the increasingly high

caliber of people who are showing an active interest in safety. He said he believes the Council is better accepted all the time as the spearhead of the safety movement, and it is up to the Council's membership and leadership to fulfill that responsibility.

Mr. Dearborn said he is working closely with the three committees of the Board—Financial Support, Social Responsibility, and Foreign Delegates to the Congress—each of which he heads as chairman. Second drafts of reports of the first two named have been prepared. He said several Board members are helping to prepare lists for invitation of foreign delegates, and the staff is developing a possible program to interest the foreign visitors.

The Board heard encouraging reports from the various Conferences and voted to hold its next meeting on April 17 in New York City.

Industrial Conference

Action of the Industrial Conference in recommending Chicago as the permanent home of the National Safety Congress followed the report of the Congress Program Committee by Chairman Gerard Griffin.

The Committee reported the question frequently is asked why the Congress is not held in cities other than Chicago. It said investigations have indicated that only Chicago, New York, Atlantic City and San Francisco have adequate hotel facilities. Comparative figures on expenses and probable income with the annual affair placed in Chicago, Atlantic City and San Francisco gave a decided edge to Chicago, the Committee said. The Conference recommendation followed. The 1956 Congress will be held October 22-26.

Henry Duffus, vice-president of the American Society of Safety Engineers, reported on suggested topics for the ASSE-sponsored Subject Sessions at the 1956 Congress. They include:

Industrial Noise — Control Measures; Nuclear Energy in Industry; American Safety Standards; Industrial Hygiene Problems; Eyes — Hearing — Health; Electrical Hazards Demonstration; Human Engineering—Biomechan-

ics; Employee Attitudes — Motivating People; Off-the-Job Safety; Comprehensive Job Placement; Safety Quiz for Safety Engineers; Crash Injury Research — Auto Seat Belts — Hard Hats; Workmen's Compensation Trends; Purchasing for Safety; A Skit—How the Foreman Can Put Safety Across; Modern Materials Handling; Guarding—a Progress Report.

Plans for a Falls in Industry emphasis campaign were discussed. The proposed Annual Inventory of Industrial Accident Prevention Activities will be conducted on an experimental basis this year with the Rubber Section cooperating.

A promising departure in the realm of Council leadership development, introduced for the first time in connection with the December meeting of the Industrial Conference, was the meeting of sectional vice-chairmen. Its purpose is to acquaint those attending with the problems they will face next year as chairmen of their respective sections.

R. H. Ferguson, vice-chairman of the Industrial Conference, presided at the meeting and explained its purposes. W. G. Johnson, NSC assistant general manager for programs, described the make-up of the National Safety Council, its purposes and objectives, organization, the programs other than industrial, how the Council is financed, and limitations on its activities (lobbying, inspection, enforcement, etc.).

David L. Arm, manager of the Industrial Department, explained how his department is organized, how sectional and special staff assignments are made, programs, and limitations. Roy G. Benson, assistant manager of the department, explained the relationship of the sections to the Industrial Conference, and reviewed a newly developed sectional activities manual.

Future programs will study other phases of sectional leadership.

The Conference voted to hold its next Conference meeting in Pittsburgh, Pa., April 11 and 12, in connection with the annual three-day conference of the Western Pennsylvania Safety Council.



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It had its beginning more than eighty years ago when Alexander Graham Bell gave the world its first telephone. It has grown as the business has grown.

Many times each day and night this spirit of service is expressed in some friendly, helpful act for some-

one in need. The courtesy, loyalty and teamwork that telephone people put into their daily jobs are a part of it.

Out of it have come the courage and inspiration that have surmounted fire and flood and storm.

We, the telephone people of today, are vested with the responsibility of carrying on this trust. It is human to make mistakes and so at times

the job we do for you may not be all that we want it to be. But in the long run, we know that how we do our individual job and how we bear our individual responsibility will determine how we fulfill our trust.

For our business is above all a business of people . . . of men and women who live and work and serve in countless communities throughout the land.

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This modern, efficient extinguisher can be repressurized with free air at an automobile service station or nitrogen from Fyr-Fyter's Dry Nitrogen Recharge Units. Visual gage tells at a glance the operating condition of the extinguisher. No annual recharge necessary!

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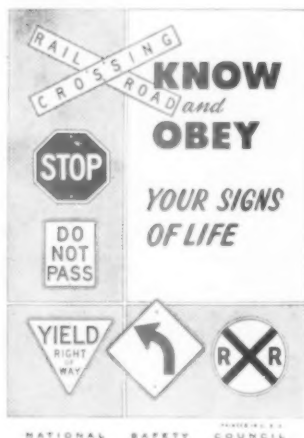
IN

NATIONAL SAFETY COUNCIL SERVICES *

Operation Safety

The March Operation Safety program is concerned with one of the most pressing problems of accident prevention—knowing and obeying traffic signs and signals, which function as “Signs of Life” for both motorists and pedestrians.

Failure to heed the warnings of these “Signs of Life” is too



often present in the over-all picture of traffic accidents. Indifference on the part of both motorists and pedestrians to the necessity for realizing the meaning of these universally accepted traffic signs and signals and obeying them without question has spelt disaster to many on our streets. Exceeding the speed limit, passing up a stop sign, ignoring the ample warnings of approaching trains given at railroad crossings—all these tally up as vital factors in traffic accidents from year to year.

Traffic authorities feel that one of the most effective ways to solve this problem of traffic behavior is by intensified measures of public education. For that purpose, the

Operation Safety program kit for March offers complete materials for conducting a trenchant attack on this aspect of accident prevention through public education.

Included among these materials, adaptable to any size community, are a complete planning guide consisting of ideas and projects built around the “Signs of Life” theme; a resume of the facts and statistics about traffic violations and accidents brought about by disregard of traffic signs and signals; radio scripts pointing up the various aspects of the monthly theme with dramatic impact; newspaper releases and an editorial cogently presenting the highlights of the traffic prevention program; a program outline adaptable to a small community campaign; complete information about other program aids such as posters, leaflets, publications, and films, and a special newsletter slanted toward women's groups.

A special addition to the March material is a copy of a complete calendar of the traffic safety information activities scheduled for February through May 1956.

For further information about the Operation Safety program, write to Bob Shinn, director, Operation Safety, National Safety Council, 425 N. Michigan Ave., Chicago 11.

Safety for the Kids

Nice Going, Pop! is the catchy title of the Council's bright new off-the-job booklet stressing child safety.

The theme of the booklet is that Dad does fine with safety on the

job and rates a “nice going, Pop” from the youngsters when he comes home. But meanwhile the family has banged itself up on the hazards in and around the house and on the streets.

Nice Going, Pop! points out that there's no place like home for accidents and that more injuries happen in the home than anywhere else. The booklet shows parents how to protect children from the dangers of traffic, drowning, falls, burns, poisons, cuts, and mechanical suffocation.

By showing management's interest in the welfare of the work-



er's family, the booklet helps promote good employee relations. And it also helps remind the worker that he's safe on the job.

Nice Going, Pop! is an eight-page booklet, printed in full color and illustrated with the comic-cartoon technique.

Ample space is provided at the bottom of the front cover for imprinting.



Look to this page each month for latest news about NSC services. Address requests for additional information, samples or prices to the Membership Department.

For a More Successful Poster Program

always
**BE ON
GUARD**
*against
accidents*



JUMBO POSTER FOR APRIL 1956

The Jumbo poster, issued monthly, is designed for outdoor use and is available to members on annual subscription but is not stocked. Its actual size is 9' 11" by 11' 8".

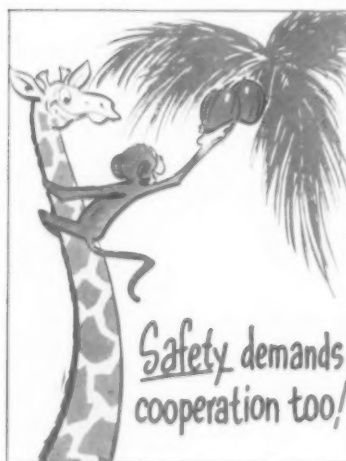
SAFETY BANNER FOR APRIL, 1956

Here is the attention-getting, monthly cloth banner. Available in two types—indoor and outdoor—both are identical in size (10 feet long by 40 inches high), have the same general message and multi-color design. Indoor type is of sturdy drill with grommets for easy hanging, while the outdoor banner is of extra heavy drill, with wind vents, and has strong stitched-in rope for durability.

POSTER program aids miniaturized on this and the following pages are **NEW** — shown here for the first time. Those illustrated in one color are actually printed in two or more colors.

For maximum variety, refer to the 1956 Directory of Occupational Safety Posters. There you'll find 756 top-notch selections on a great variety of subjects.

Copies of the Directory are available at 50 cents each—write Membership Service, N.S.C.



NATIONAL SAFETY COUNCIL
0683-A 8 1/2 x 11 1/2

This new four color poster is illustrative of the 72 four color posters shown in the 1956 Poster Directory.



Electrotype of poster miniatures on this page are not available, nor can payroll inserts be supplied.

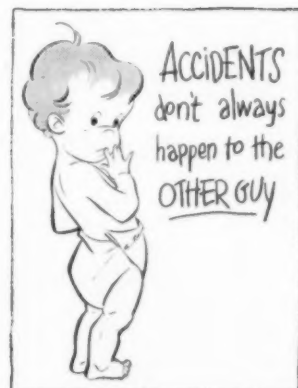
Posters below are printed in two or more colors
(Available only in sizes indicated)



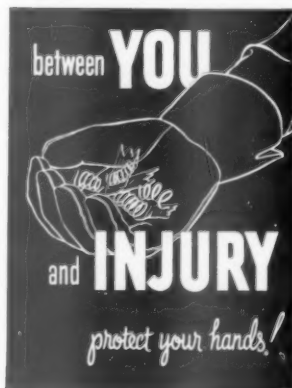
NATIONAL SAFETY COUNCIL
0715-C 25x38



NATIONAL SAFETY COUNCIL
0474-A 8½x11½



NATIONAL SAFETY COUNCIL
0526-A 8½x11½



NATIONAL SAFETY COUNCIL
0538-A 8½x11½



NATIONAL SAFETY COUNCIL
0483-A 8½x11½



NATIONAL SAFETY COUNCIL
0435-A 8½x11½



NATIONAL SAFETY COUNCIL
0691-B 17x23



NATIONAL SAFETY COUNCIL
0674-A 8½x11½



NATIONAL SAFETY COUNCIL
0684-B 17x23

Electrotypes of payroll can be furnished in all poster illustrations shown above.

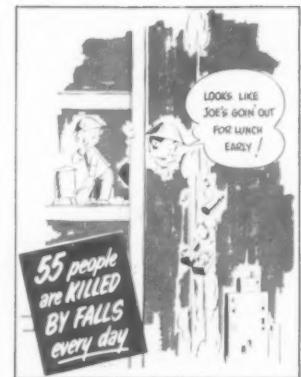
Posters below are printed in two or more colors
(Available only in sizes indicated)



NATIONAL SAFETY COUNCIL
0676-B 17x23



THINK AHEAD FOR SAFETY!
NATIONAL SAFETY COUNCIL
0575-A 8½x11½



NATIONAL SAFETY COUNCIL
0452-B 17x23



NATIONAL SAFETY COUNCIL
0687-A 8½x11½



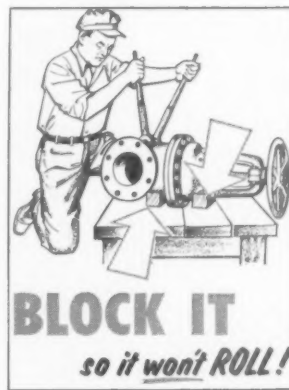
IT'S UP TO YOU!
NATIONAL SAFETY COUNCIL
0659-B 17x23



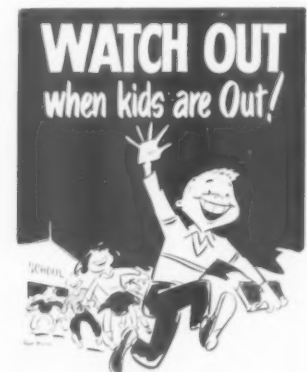
NATIONAL SAFETY COUNCIL
0625-A 8½x11½



NATIONAL SAFETY COUNCIL
0645-A 8½x11½



NATIONAL SAFETY COUNCIL
0624-A 8½x11½



NATIONAL SAFETY COUNCIL
T-0652-C 25x38
T-0653-A 8½x11½

Electrotypes of payroll can be furnished in all poster illustrations shown above.

Men Who Follow Us

—From page 19

safety principles so that they can do the bulk of the safety education in the field, where it counts most.

Roast beef today, beef pie tomorrow, hash on Wednesday—that's safety! The same dish must be served constantly in varied forms.

6. Pride in Profession

Let us also teach the coming safety engineer the value of safety work so that he may have justifiable pride in his profession. Let us help him to enhance and dignify his stature so that he will be respected for what he is trying to do—prevent accidents, save lives, alleviate suffering, and protect property.

We shall teach him to recognize the rewards that come from the knowledge of a job well done. If these rewards are not always of a material kind, they often have a spiritual value that can balance the inevitable frustrations of safety work.

7. How to Get Along

Finally, and of utmost importance, we must teach the men who will follow us the necessity of getting along with people. A good part of the safety job is getting people to work for you. That takes tact, firmness, humor and understanding. Dale Carnegie stuff, perhaps, but indispensable for this type of work. Success of a safety engineer's efforts depends on his ability to get people to do things his way—the safe way.




"You two should get acquainted."



don't let heat fatigue
"KO" your workers
this summer



be sure you have
 Salt Tablets
when you need them!

buy now and save
**EARLY
ORDER
DISCOUNT**
for orders received
before March 31, 1956

Get the jump on hot days ahead . . . order MSCO Impregnated Salt Tablets *now*. Your workers will have them the first day temperatures soar . . . you'll save by buying at "early order" prices. Tablets will be shipped from your local safety distributor's stock to expedite your order. And remember, when you buy MSCO, you buy *impregnated* salt tablets—with *controlled* action to replace needed body salt *immediately*, but at a gradual rate to meet the body's needs. In *expendable* dispensers with bracket for wall locations, or in handy plastic vials for field workers. Write Medical Supply Company for literature and prices, or see your nearest MSCO distributor.



100 Vials



500 Tablet Dispenser



1000 Tablet Dispenser

Medical Supply Company
Rockford, Illinois • In Canada, It's Safety Supply Company

No injuries, no damage



**The Accident did NOT happen
thanks to
A.W. ALGRIP World's only Abrasive
rolled-steel floor plate**

No skid!

On ALGRIP—under the most hazardous slipping conditions—wheels and men's feet hold fast in the powerful friction grip of thousands of abrasive, friction particles.

ALGRIP—made by a patented process—is rolled steel into which a grinding-wheel type of abrasive has been pressure-rolled—not coated—to a uniform depth. Wear and tear merely exposes more abrasive particles. Overlaid or as a complete flooring requiring minimum maintenance, ALGRIP fabricates easily—soon pays for itself in slashed accident and insurance rates.

Make a test installation in your worst slipping area. Watch accident rates tumble and morale improve.

Call or send for detailed booklet today.

**A.W. ALGRIP ABRASIVE ROLLED
STEEL FLOOR PLATE**



ALGRIP—approved for safety by Underwriters' Laboratories

ALAN WOOD STEEL COMPANY
Conshohocken, Pa.

Please send A.W. ALGRIP Booklet AL-26

Name

Title

Company

Address

City

Zone State



Other Products: A. W. SUPER-DIAMOND Rolled Steel Floor Plate—
Plates—Sheets—Strip—(Alloy and Special Grades)

Inside NSC

—From page 56

efficiency of the staff due to hot weather is conservatively estimated at \$44,000 (10 per cent of payroll for three summer months). Actual closing of the offices for 13 hours this past summer accounted for an additional payroll loss of \$12,000. Total losses due to hot weather: \$56,000. Thus the investment in air-conditioning will yield better than a four-to-one return.

Membership Service Tip

We initiate with this edition of Inside NSC the "Membership Service Tip" department. The purpose of this department is to provide friendly reminders and helpful suggestions that will aid the Council staff to serve you quickly and with a minimum of errors.

Here's tip No. 1, on changing addressing plates.

The problem: A name is misspelled on an addressing plate, or there is a title or an address change, or the wrong materials are being sent on this label. The fact that errors on addressing plates are not rectified quickly is probably the number one "irk" of Council members—and keeping over 150,000 addressing plates current is one of the big headaches of the Council staff. Here's a tip that will help us make addressing changes quickly for you.

The tip: Tell us exactly what changes have to be made on the addressing label and if possible send us the old label. Most labels contain codings which give us a clue to where to look for this particular plate. Without the label we have to bird dog through scores and scores of addressing plate lists.

And, give us at least a month to get an addressing plate change made. We may make the change immediately, but since publications may be mailed two weeks or more before the month of their issue, you may receive a wrongly addressed NATIONAL SAFETY NEWS in March although we took care of the change early in February.

Medical Research Center to be Built at Brookhaven

A MEDICAL RESEARCH center, including a nuclear reactor for medical research and treatment, will be constructed at Brookhaven National Laboratory, according to an announcement by Lewis L. Strauss, chairman of the U.S. Atomic Energy Commission. Brookhaven, one of the AEC's major research laboratories, is operated by Associated Universities, Inc.

Scheduled for completion in two years, at a cost of \$6,000,000 exclusive of design and engineering, the new facility will house a nuclear reactor, a research hospital, an industrial medicine branch, and research divisions in medical physics, pathology, microbiology, biochemistry, physiology and clinical chemistry.

The present medical facility at Brookhaven consists of some 20 temporary buildings which were part of Camp Upton hospital used by the Army during World War II. As the medical program has grown, the buildings have become more inadequate to its needs as well as more difficult and costly to staff and maintain.

The medical reactor at Brookhaven will be one of the first two in the United States. In July the commission announced that the University of California had filed license applications with the commission for construction and operation of a medical reactor on the campus of the University of California at Los Angeles.

Medical research and treatment with neutrons have been conducted at Brookhaven since 1951 by utilizing the general purpose research reactor already in operation there. Treatment of patients at this reactor, however, requires that other work cease during the medical run, interrupting research programs of other laboratory departments. The new reactor, designed specifically for medical utilization, will make available a source of neutrons for experimental work on brain cancer, as well as a number of special short-lived radioisotopes, permitting a much wider range of medical investigation.

FUMES COST MONEY!



Don Witte, Seattle

OCM requires little or no maintenance. Catalytic units last up to 2000-2500 hours — can then be easily and economically replaced. Non-leaded gasoline must be used with the OCM.

**OCM
CATALYTIC EXHAUST
KILLS DANGEROUS
CARBON MONOXIDE,
FUMES AND ODORS
FROM BOTH LP AND
GASOLINE-POWERED
EQUIPMENT**

Photo courtesy Stokely-Van Camp, Inc., Frozen Food Division

Noxious, foul-smelling exhaust fumes and odors need never be a problem in your plant again. For wherever you operate LP or gasoline-powered equipment indoors—even part time—Oxy-Catalyst Exhaust Systems provide an effective way—the *only* way—to good fume elimination.

Operating by catalytic reaction, the Oxy-Catalyst OCM eliminates 95% or more of the dangerous carbon monoxide—90% of the irritating hydrocarbons—from the exhaust gases of lift trucks, bulk handling trucks, stationary engines—any type of equipment run by gasoline or by LP gas.

You know how both gasoline and LP exhaust fumes can cause headaches, eye irritation, nausea and worse. These mean production slow-downs that cost you money. With the OCM, you can run your equipment continuously, efficiently, safely, without objectionable exhaust fumes, in even closely confined areas. And you get the full benefits of greater employee productivity and morale.

If you're interested in cutting costs by speeding production—if cleaner, safer air is important in your plant—write now for complete information on the OCM and name of your nearest supplier.

For Diesel Exhaust Fumes: New OCM Dieseler reduces below objectionable levels harmful, irritating exhaust from any 4-cycle diesel engine when running at or over 60% load. Write for details.



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MANUFACTURING • ENGINEERING • RESEARCH

Fume and Odor Elimination, Air Pollution Control, and Waste Heat Recovery

OXY-CATALYST, INC., Wayne 2, Pa.

Please send complete information on:

☐ OCM Exhaust for gasoline engines

☐ OCM Dieseler for 4-cycle diesel engines

☐ Send name of nearest supplier

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Firm _____

Street _____

City _____

Zone _____

State _____

Inquirers in the U.S.A. or its territories, or in Canada, should write to Wayne, Pa. Inquirers elsewhere should write to Pan American Chemical Inc., 9 Rue La Perouse, Paris 16, France.



"AKBAR"



The Kinnear Steel Rolling Fire Door with

EXTRA SAFETY Features



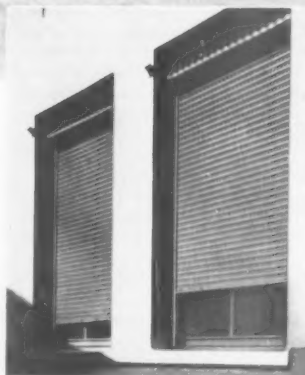
Akbar Fire Doors — another famous Kinnear product — combine quick, positive, automatic fire protection with features that provide maximum safety.

When fire threatens, the doors are automatically pushed downward by a strong starting spring . . . yet their downward speed is controlled, for the safety of anyone passing through the opening at the time of emergency release.

As another safety measure, Akbar Doors feature *separate* counterbalance and starting springs. For emergency exit, the doors can be opened *after* automatic closure.

Another Kinnear device stops the door at sill level *even if the sill is burned away*. This assures maximum closure of the doorway area, even under adverse conditions.

When not in use, Akbar Doors remain coiled overhead, out of the way. Approved and labeled by Underwriters' Laboratories, Inc., they



have saved as much as one third of their cost *per year* in reduced insurance rates. They are built any size, to fit each specific opening — for either old or new buildings.

Akbar Doors can also be used for regular daily service, with Kinnear Motor Operators for electric push-button control if desired. Where maximum fire protection is not essential, *nonlabeled* Kinnear Steel Rolling Doors are recommended. Write today for catalog or specific information.

The KINNEAR Mfg. Co.

FACTORIES

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1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in All Principal Cities

SAVINGWAYS
in
DOORWAYS

KINNEAR
ROLLING DOORS

Safety Library

—From page 50

John T. Mountain and others, AMA Archives of Industrial Health. Nov. 1955, p. 494.

Toxicity of Naphthenic Acids and Their Metal Salts. William T. Rockhold, AMA Archives of Industrial Health. Nov. 1955, p. 477.

Hospitals

Guide to a Planned Safety Program. James E. Ludlam, Hospitals. Dec. 1955, p. 68.

A Health Program for Employees. Helen Reischl, Hospitals. Dec. 1955, p. 78.

Organizing and Controlling the Use and Safe Handling of Isotopes. Bertram V. A. Low-Beer, Hospitals. Dec. 1955, p. 51.

Mines

Improved Safety and Operating Efficiency with Sound-Powered Phones. Robert W. Edwards, Mining Engineering. Dec. 1955, p. 1116.

Prevention of Falls of Ground Accidents. Canadian Mining Journal. Nov. 1955, p. 64.

Study of the Health of Workers Employed in Mining and Processing of Vanadium Ore. Frederick J. Vintinner, AMA Archives of Industrial Health. Dec. 1955, p. 635.

Noise

Noise Health Hazards in the Air Force. Jack C. Carmichael, Public Health Reports. Dec. 1955, p. 1251.

Printing and Publishing

Safety — Good Management of a Safety Program in a Printing Plant Is Profitable Two Ways. Oliver R. Sperry, Modern Lithography. Dec. 1955, p. 47.

Radiation

External Radiation Exposure in the Radium-Dial Printing Industry. John E. Silson and others, AMA Archives of Industrial Medicine. Nov. 1955, p. 503.

Pulmonary Effects from Radioactive Barium Sulfate Dust. H. Cember and others, AMA Archives of Industrial Health. Dec. 1955, p. 628.

Vision

Super Vision. James R. Gregg, Supervision. Dec. 1955, p. 18.

Liquid Metals For Atomic Power Plants

LIQUID METALS are replacing water, the conventional heat transfer medium in power plants,

in some atomic power plants, it was disclosed at the Nuclear Engineering and Science Congress in Cleveland, December 13.

The problems encountered in this major innovation were presented by W. L. Fleischmann and R. F. Koenig, Knolls Atomic Power Laboratory, General Electric Company, in a paper submitted under the auspices of The American Society of Mechanical Engineers, one of the sponsors of the congress.

Sodium and an alloy, sodium-potassium, are among the liquid metals chosen for heat transfer. These metals will flow through a heat transfer system at temperatures up to and above 1300 F. as water flows through heating systems in many homes.

The principal advantage of sodium is its high boiling point, which means that no pressure is required in the system to hold the transfer medium at extremely high temperatures. At the same time, sodium liquefies at a temperature just under the boiling point of water, so that if it solidifies in the system, it is relatively easy to liquefy again.

Also, sodium permits high rates of heat transfer and its low viscosity makes pumping power requirements reasonable. Its reaction to nuclear radiations is not quite as good as those of some more expensive metals, but it is infinitely better than that of mercury. Its chief disadvantage is its violent chemical reaction with water, which necessitates extra precautions and expense in guarding against leakage.

The use of sodium has required a careful study of the effects of sodium on the materials of which the heat transfer system would be fabricated. These studies have shown that the major problems are corrosion resistance and high thermal stresses. Designers must make a difficult choice between the corrosion-resistant materials that have low heat conductivity and high expansion, and the less corrosion-resistant materials that have better thermal conductivity and lower expansion. Since the system would work at low pressures, the major design problem is providing resistance to fatigue stresses in the system.



How much will you save this year on Floor Maintenance?

Plenty, if you switch to LEGGE Safety Floor Maintenance. Here's why:

1. You save on materials. LEGGE polishes stay on the floor, in many cases, *more than 4 times as long* as ordinary polishes.
2. You save on labor. You need fewer applications, less touch-up maintenance and only rarely do your floors require the time-consuming stripping job.
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4. You save waste motion. A LEGGE Safety Engineer trains your crews, shows them how to prevent wasted effort and materials.
5. You save on insurance. LEGGE polishes go up to 75% *beyond* U.L. requirements for slip-resistance. The danger of slip-accidents becomes negligible. An improved Safety record usually means reduced casualty premiums.

Learn how one famous institution topped \$19,000 off its annual budget. Send for our Free booklet, "Mr. Higby and the Gremlin". Colorfully illustrated, fun to read, it tells you the inside story on floor care. Clip coupon today, please.



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BRANCH OFFICES
IN PRINCIPAL CITIES.
IN TORONTO—
J. W. TURNER CO.

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- ☐ Send a Free copy of your informative Floor Care booklet.
- ☐ Have a LEGGE Safety Engineer phone for an appointment. No obligation.

Name _____

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MORE *built-in* PROTECTION!



SODA-ACID STAINLESS STEEL EXTINGUISHERS

- LARGE RADIUS ELBOW
- LEAD STOPPLE
- POSITIVE BOTTLE CLAMP
- STAINLESS STEEL CAGE
- WATER LEVEL MARKER
- HEAT-PROOF 8 OZ. BOTTLE
- STAINLESS STEEL, ELECTRIC WELDED CONSTRUCTION
- LIGHTWEIGHT . . . 7 lbs. or 1/2 lighter than ordinary types.
- STRONG . . . tested to 500 lbs., ordinary types tested to 350 lbs.
- DURABLE . . . rust, acid, corrosion resistant.
- KINK-PROOF HOSE
- CONVEX BASE . . . for strength
- PLASTIC NOZZLE
- CONVENIENT HANDLE

2 1/2 GALLON SIZE AND
20 & 40 GALLON WHEELED ENGINES

**UNDERWRITERS' LABORATORIES,
AND FACTORY MUTUAL APPROVED!**

You get surer fire protection from Buffalo better-built extinguishers because there's more protection built-in! Highest engineering standards, exacting manufacture and precision inspection produce the finest extinguishers possible. Dealing with your Buffalo industrial distributor has many advantages. He carries a complete line of Buffalo better-built portable extinguishers, parts and recharges. Simply call him, one transaction will answer your fire protection needs in a hurry. Call him now! He is listed in the yellow pages of your telephone directory!

**WRITE TODAY FOR THIS COMPLETE
POCKET GUIDE TO FIRE PROTECTION!**

SINCE 1895 . . .
BUFFALO FIRE APPLIANCE
CORPORATION
DAYTON 1, OHIO



Skins Are Effective

—From page 58

matitis in women is under a broad wedding band where soap particles are captured and held in prolonged contact with the skin.

The sequence of events in contact dermatitis due to primary irritation from soaps is probably this: Repeated and prolonged use of soap leads to excessive degreasing or removal of the protective sebaceous film; also to excessive removal of the horny cells of the keratin layers. As a result, the living subjacent cells are exposed to the alkalies and fatty acids of soaps; in addition, the protective buffering mechanism of the acid mantle is temporarily lost. In the end, the living, unprotected cells of the epidermis are exposed to and irritated by the alkalies and fatty acids and they become inflamed.

As more and more chemical insult is superimposed, the inflammatory state is increased and its boundaries widened. And, very commonly, in the inflamed areas secondary bacterial invasion takes place, tending to exacerbate and perpetuate the dermatitis.

Moreover, skin inflamed by a primary irritant is made more vulnerable to allergic sensitization. This may explain the remarkably high incidence of chromate sensitization in cement workers. The high alkalinity of cement induces a primary irritation dermatitis producing a soil fertile for the development of sensitization to the minute amounts of chromates present in many cements.

In allergic contact dermatitis an entirely different mechanism is visualized. Here, dermatitis never occurs on initial contact. There must be a period of incubation of six days or more after the initial contact and it is during this period that the state of tissue hypersensitivity is developing. After tissue hypersensitivity is established, there must be an eliciting contact with the specific chemical before the manifestations of dermatitis appear.

It is believed, though not yet proved, that antibodies to the specific chemical are being formed

during the incubation period. This syndrome is in essence a specific antigen-antibody reaction of the delayed type. In allergic contact dermatitis it is the rule that the entire skin surface becomes abnormally responsive and application of the causal chemical to any area may elicit a dermatitis.

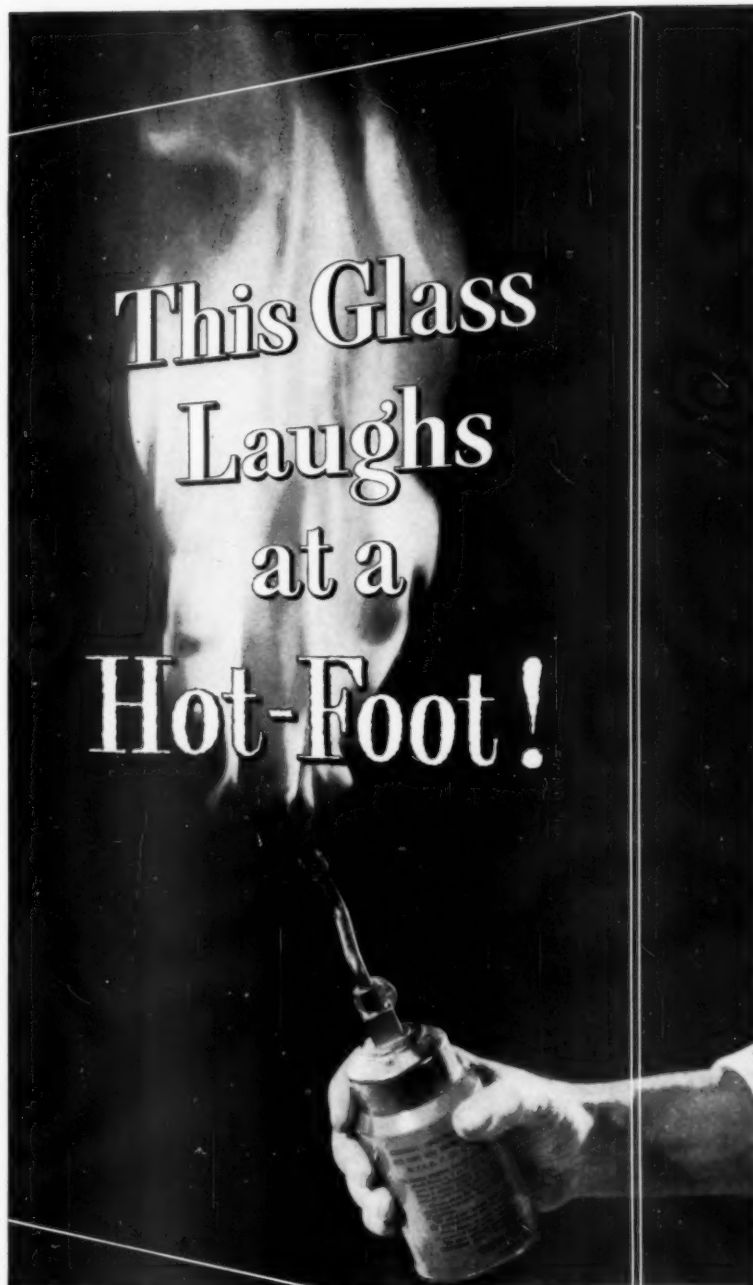
While there is a rare dissenting opinion, the consensus is that contact dermatitis due to soaps and other detergents is almost always the result of primary irritation. Sensitization must be very rare, and when it occurs it is usually due to additives such as coloring agents, perfumes, and antiseptics. The new detergents are on the whole more acid than soaps and I believe they cause less primary irritation but more sensitization than soaps.

Dermatitis from soaps occurs most often at the sites of greatest contact, particularly the hands and forearms. The palms are seldom involved, possibly because of the very thick keratin layer. The dorsal surface of the hands, the dorsolateral surfaces of the digits, and the web spaces are most vulnerable.

As a rule the dermatitis is spread out, although discrete patchy types of the so-called nummular or coin-like configuration are not rare. The inflammatory state may be very mild, consisting simply of slight pinkness, some roughness, and scanty scaling. When it is severe, there may be intense edema, marked redness and heat, blistering and fissuring. Itching may be extreme and intolerable, and flexing the fingers impossible because of the edema.

The objective changes in the skin are very much the same in dermatitis due to primary irritation and to allergic sensitization. Even though gross evidences of secondary bacterial infection are lacking, I believe that bacterial infection complicates all but the mildest cases.

The diagnosis of contact dermatitis is usually simple although one cannot say by mere observation that soap is the causal agent. It may be necessary to carry out patch tests to eliminate other chemical contactants as etiologic



See this hand torch blast flame on the cold glass!

Some manufacturers use *Tuf-flex** as a window in a furnace. *Tuf-flex* tempered plate glass resists 300% more thermal shock than regular polished plate glass of the same thickness.

Other manufacturers use *Tuf-flex* as a glass cover to protect certain mechanisms. $\frac{1}{4}$ " thick *Tuf-flex* is so tough that a $\frac{1}{2}$ -lb. steel ball, dropped 10 feet, bounces right off.

See all the ways you can use this glass to improve your product or production process.

FOR YOUR FREE *TUF-FLEX* BOOKLET, TF-8, write Dept. 7326, Libbey-Owens-Ford Glass Co., 608 Madison Avenue, Toledo 3, Ohio. And order *Tuf-flex* from your local L·O·F Glass Distributor or Dealer . . . listed under "Glass" in the yellow pages of phone books.



LIBBEY·OWENS·FORD a Great Name in *Glass*

agents. Patch tests with soap are not of value since most persons will react with inflammation when soap particles are held against the skin for 24 to 48 hours.

Diluted soap emulsions, in concentrations of one to five per cent, are considered by some valid for the detection of hypersensitivity. Presumably only those persons who have a true allergic hypersensitivity will react to these low concentrations. In those cases where an additive is incriminated, such as a dye, a perfume, or an antiseptic, it is simple to patch test with these chemicals alone in their proper concentration.

The first requirement in therapeutic management of dermatitis is complete avoidance of soaps and other cleansers. There is not to my knowledge any soap or detergent that is well tolerated by inflamed skin. Water also acts as an irritant and should be avoided. Topical therapy should be simple and bland, and should carry with it no significant risk of superimposed treatment dermatitis. I believe that the local anesthetic and antihistaminic preparations should never be used since they have a prohibitively high index of sensitization.

Where there is considerable inflammation and edema, warm compresses or soaks are very beneficial, and I prefer simple agents such as normal saline or boric acid solution. Emulsions are usually better tolerated than ointments, and calamine liniment is a useful one. Lotions of hydrocortisone or 9-alpha fluorohydrocortisone are expensive but are unsurpassed for the abatement of inflammation and pruritus.

Since infection is commonly present in the acute phases, the oral administration of sulfonamides or broad-spectrum antibiotics for three to four days is usually desirable and valuable. Where suffering is severe, it is justifiable to administer ACTH Gel by injection or corticosteroids orally. These drugs will usually produce prompt suppression of inflammation and itching, but more important, they may shorten the entire course of the illness. Moreover, they need be used only for a short period in these cases.

Spare Tire Can Be a Life-Saver



THE SPARE TIRE in the trunk of an automobile has often been called a "life-saver" by motorists who suffer tire trouble on the highways. But the spare tire can literally live up to its nickname when it comes to rescuing drowning persons, according to tire engineers at The B. F. Goodrich Company, Akron, Ohio.

The annual crop of warm weather drownings reveals that many of the tragedies occurred because of the lack of life-saving equipment or the inability of an unskilled swimmer to save another. And yet, the tire men point out, a first class life-saving tool was within easy reach in many cases—the spare tire in the car trunk.

Water rescue demonstrations (similar to the test shown above) by police and safety groups have shown that a properly inflated spare tire, wheel and all, can support up to six persons safely in the water. Even a person who cannot swim can easily push a tire out to a person struggling in the water. The rescuer can keep the tire between himself and the person in distress, preventing the drowning person from grabbing the rescuer. What's more, the spare tire can be equally effective in winter use as a rescue tool in the case of persons breaking through thin ice.

The value of the spare tire as a life preserver may lead auto manufacturers to design spring release spare tire assemblies that will release the tire in a few seconds with a minimum of effort.

In the meantime, tire engineers say, remember the spare tire the next time you witness a drowning emergency. Keep air in your spare; it may save a life.

There is, no doubt, a good deal of dermatitis due to detergents. Nevertheless, I believe that the over-all incidence must be relatively low when one considers the enormous quantities of these materials that make contact with the skin daily. Some credit for this must go to the manufacturers for

the excellence of their products but I think the greatest credit should go to the human skin and its remarkable protective and reparative powers.

However, the problem of soap dermatitis continues to be an important one and I cannot envision its solution by the development

some time in the future of an ideal, universal cleanser. There is too much variation in the human skin and in the conditions of usage to permit this.

But, I can see progress in two directions: First, education of the public to the risks of excessive contact with soaps and detergents, and secondly, the synthesis of new cleansers for special purposes that will have even less harmful effects on the skin.

Using LP Gas for Industrial Trucks

WHEN LP GAS is used as fuel for industrial trucks, the insurance carrier should be notified. All conditions of use should be noted.

Such vehicles should not be exposed to high temperatures, as in the neighborhood of ovens and furnaces. When not in use trucks should be stored either outdoors or in well-ventilated or detached locations. Detachable fuel tanks may be removed and stored in a suitable location.

Permanently-mounted fuel tanks should be filled out of doors, keeping within specified capacities at specified temperatures. If removable tanks are to be changed indoors, the manufacturer's instructions should be followed.

Trucks with engines modified for LP gas are now available. Conversion of gasoline trucks can be carried out by the user with kits prepared for this purpose. Equipment includes a special carburetor or adaptor, vaporizer regulator, fuel tank and lines, and shut-off and relief valves. Equipment to be converted should be in good condition.

Drivers should be instructed in the use of this fuel and know what to do if a leak should occur.

The difference between listening to a radio sermon and going to church is like the difference between calling your girl on the phone and spending the evening with her.—Rev. L. Gene Stewart, *Christian Advocate*

Wide feet are said to be a sign of efficiency and intelligence.



to guard
your workers hands
against irritation
and infection

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Daily hand washing with VESTAL SDC forms an invisible but protective film on the skin. For SDC contains the antiseptic agent, Hexachlorophene, which remains on the skin after the hands are rinsed and dried. This antiseptic film provides a continuous barrier to infection and disease transmission—with complete skin safety.



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NAME _____

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Industrial By-Products

—From page 27

the skin, regardless of depth or extent, we pretty much ignore the magic multi-colored paints and antiseptics. These hands are dirty, in an honest way, and they're crawling with bacteria. Any chemical which will clean the hand of dirty dirt and bacterial dirt does so only by practically dissolving the tissues, healthy and

injured alike. So we fall back on the time-honored and proven method of cleaning—soap, water and elbow grease, in large quantity.

Here, however, we introduce two innovations. First, we anesthetize the wound (or patient) so we don't make him hurt worse than he already does, and second, to potentiate the soap, water and scrub, we use a G11 soap. If you want the fancy name—hexachlo-

rophene. It's a fantastically powerful and safe antiseptic.

This done, the wound is closed as completely, cleanly and neatly as possible. We don't necessarily give penicillin or any of the magic drugs. Contrary to currently popular belief, wounds heal up now (as they have for thousands of years) without them.

All hand and finger injuries are splinted, not necessarily in a plaster cast. Perhaps it is only with a heavy dressing or by dressing two fingers together, but splinted none the less.

And here the foreman enters the picture again. We're aware that a man with two or three fingers splinted is at a disadvantage and it's awkward to work. But this man, put back on some sort of job, is still producing and still has a minor injury. The tough foreman who demands 110 per cent production from this man is not going to get it. Furthermore, by making a failure out of this man he has converted the injury into a major injury.

One other item which falls into the shocking category is our treatment of finger nails which are torn off, or practically so. It seems fairly standard practice to remove an irreparably damaged finger nail. But have you ever thought about why God gave us finger nails? Obviously for protection of finger tips. After all, what are steel-toed shoes but a cap over the vulnerable spot? And very logically, a finger needs protection when it's cut or broken. To me, this is no time to remove that protection.

Consequently, whether the nail is completely off or nearly so, we replace it and hold it on with a couple of stitches. And until the source of the hurting is cured—fracture, laceration, or what—we leave it there. The new nail will come in behind it, the "piggy back" nail can be removed, and the man feels good. Recently we removed the sutures from a nail that had been held in place (because of a fracture) for six weeks. His splint was built on, his stitches weren't infected (G11 soap again) and he assured me his fracture had never hurt during that time.

We get these men out of splints and encourage motion at the earli-



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est possible moment, knowing that at times we're compromising their cosmetic result with good function. But God gave us hands and fingers for function; for looks He gave us faces!

With fractures, the principle is about the same. We tell these men their fingers are going to hurt plenty for the first 24 hours. So they are forewarned, and they usually don't hurt as much as they expect. Further, we tell them truthfully that most of their hurting is in the first 24 hours and if they can tough that out (and we give them drugs for relief of pain) that it will be fairly easy after that.

Thus armed, the man in a sense feels like a hero, a tough guy, because he survived that period. Again, as early as possible, we get splints off and start motion—long before x-rays show complete healing. If we wait until x-rays show the bone completely healed, the finger will be stiff from being splinted so long. Our average finger is splinted from seven to 10 days only; some as little as three days.

We've had some weird experiences with finger amputations. They're fairly common and not too difficult to treat, but for one thing. A man is brought in with a finger tip off; the skin won't pull together over the stump. To get more skin means taking a skin graft, or further shortening the finger, which is another neat way of creating a major injury.

Where is the end of that finger? Somebody just flushed it down the john or buried it. We ask them to bring it in and they think we're big

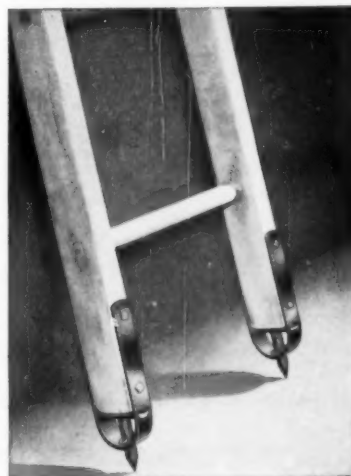
comedians. But it's the patient's skin and perhaps can be used for a graft. So, whether it's in his glove, in the ground, or wherever, bring it in. We've had cases where we replaced finger tips and they grew.

Our difficulties with eyes are usually minor but exasperating. They usually revolve around some do-gooder in the department who is only glad to remove a foreign body, and he usually gets it out. The man feels more comfortable and everything is lovely—until next morning. Only one eye will open; the other is glued shut with thick, sticky pus.

And from where? Not from the foreign body—from the handkerchief used to remove it—the handkerchief he's been using for four days for that awful cold. A five-minute trip to the dispensary would have prevented it all. As it is, within two or three days and many treatments the eye will be as good as new—we hope!

As for buried metallic bodies, they're common and psychologically they're hard to handle. Usually there's a very small puncture wound and x-ray shows a sliver of metal deep in the tissues. And digging for slivers of metal makes finding a needle in a haystack look like child's play.

You don't just open up an arm or a hand like a suitcase and lift out the foreign body. It may take hours to find it, and in the process considerable damage can be done to nerves, tendons, etc. Anyhow, if the body is not encroaching on any vital center it isn't going to cause any trouble. Mother Nature will wall it off with a tough cap-



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... and prevents ladders from slipping and sliding

When a ladder rests on wood surface or on the ground, you can prevent it from hazardous slipping and sliding that may cause injuries to employees, if you fit the ladder with Diamond Point Ladder Shoes.

This is especially true where the ladder must be mounted on uneven terrain. The sharp Diamond Points anchor the ladder in position so that employees can work in full confidence that the ladder will not slip.

Diamond Point Ladder Shoes are made of 1¼ inch steel, ⅝" thick with case hardened points that can be depended upon for long, satisfactory service.

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sule and that's the end of it.

Consequently, as far as possible, we leave buried foreign bodies buried. If they ever cause trouble, we can take them out later; they aren't going any place. For confirmation, note the number of war veterans still hauling around pieces of shrapnel.

In dealing with burns, we again run into the results of the tender ministrations of do-gooders. For some reason, everybody is an ex-

pert on burns. We've seen patients with lard, vaseline, waxed paper, axle grease, mud and soda on their burns when we inherited them. One patient had even been treated with ink—royal blue permanent.

So, our first job was trying to separate the patient from his first-aid treatment. Having done this, we're finding again that Mother Nature, given half a chance, does a pretty good job of healing burns.

They aren't wrapped in yards of gauze and pounds of grease any more. They're cleaned, kept clean with G11 soap, not dressed, and nature supplies the dressing in the form of a scab or crust. Initially, they are repulsive to look at, but the end results, as far as scarring or deformity are concerned, are better.

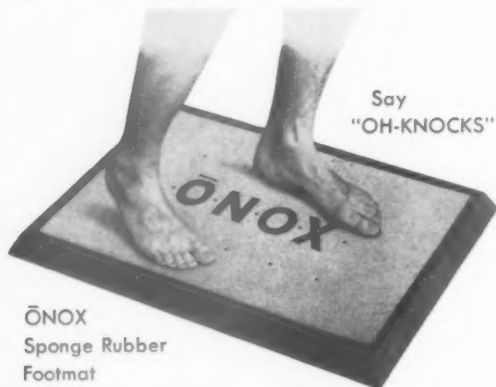
This idea of minimizing disability certainly is not new. It was demonstrated to be eminently successful in World War II. I refer to the use of tetanus toxoid given in advance of injury so that they develop their own immunity to tetanus. Then, whether the injury happens on the job, or in their own back yard, there is no need to give the conventional tetanus antitoxin.

This antitoxin is made from the blood serum of horses which have been immunized against tetanus. Theoretically, when injected into the human body it should prevent the development of tetanus in a man who has been injured. As a matter of fact, this prophylactic dose of horse serum tetanus antitoxin cannot be depended on to give immunity for longer than about six or seven days, and the incubation period of the disease may well be longer than that. So, when the man develops tetanus, his passive immunity has already come and gone. Further, with every injection of horse serum, the chances of severe reaction on the part of the patient increase, and these reactions may even be fatal.

This conversion of a minor injury into a really major one is very common, because the average serum reaction may lay a man out for five to seven days. Consequently, our feeling about prophylactic tetanus antitoxin given after an injury is that the only one who gets any real benefit is the horse; he developed his own immunity.

The answer to the problem is on one hand ridiculously simple; on the other hand it is fantastically complicated. Simple in the sense that a tetanus toxoid shot once a year will give a man almost 100 per cent immunity; complicated in the sense that to the average man a "lockjaw shot" is a lockjaw shot. He already knows

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somebody who has had a severe reaction, so he refuses to take the toxoid. Consequently, a lot of salesmanship and explanation are in order.

We immunize all new hires and call them back once a year for their booster, then give present employees their toxoid the first time they are in the dispensary for any reason. The ones who haven't had toxoid will have to be given treatment doses of horse serum antitoxin if they really need it after they are injured.

Those Aching Backs

We have lots of sore backs, strained backs, sprained backs—in general, aching backs. Only a few of the most severe ones, such as discs, are amenable to any specific treatment. The vast majority of them are worrisome to the patient and to the medical department and tend to get well no matter what is done. But in the process, perhaps getting well can be hastened by lighter work, heat, diathermy, supporting belts, and medication.

If we have any idea to offer in the way of minimizing disability from sore backs, it is simply conversation. Most men agree that when a back is hurting moderately that it hurts just as much at home as it does at work. And rather than go on the lesser income of compensation, they would about as soon work. Here, co-operation with supervision is of utmost importance. The 110 per cent foreman can readily make a major disability out of a sore back by demanding that kind of production.

Thanks to Safety Shoes

Fractured toes and feet are, happily, on the decline, thanks to the unending promotion of safety shoe men. But they still occur—even in safety shoes. The same situation as with fingers is present here; admit they hurt, and that they hurt most the first 24 hours. But if the man will go along with one idea—never bear weight on the foot unless he is wearing a snug-fitting shoe, he will probably get along all right.

So, except for the major fractures, we put an extra sock on the man and get him right back

into his own firm shoes. After the first day he will get along well. But here we have to get along with the neighborhood experts who advise (if the man hasn't already thought of it) cutting off the toe of the shoe to get the pressure off the fracture. This accomplished, we can pretty much guarantee that a man will have a sore foot and will be disabled for about a month.

After all, a fracture hurts be-

cause jagged ends of bone are grating against each other, and the man's own snug-fitting shoe offers about the best possible splint or cast. The cut-out shoe promotes the grating and makes him worse.

Next to the horrified whistling nurse I mentioned, the worst conversationally complicated injury I know of is a sprain. From a scientific standpoint, a sprain consists of tearing of ligaments around a

sellstrom safeguard -- of the Month



No. 299

The New 299 is Smaller and Lighter than any other Fibre Glass Helmet

This Fibre Glass helmet is a recent design developed for the exacting requirements of ship building and other specialized welding operations. It is very compact to permit welder to enter confined areas, yet allows complete freedom of movement

when working in restricted quarters and unusual positions.

The uniquely contoured bottom excludes fumes and serves as a breath deflector for better air circulation. Its many outstanding design features and light weight, together with the availability of all types of headgears and lens holders, make this helmet especially suitable for all welding operations.

Two Additional New Models—Distinctively Different!

There's a Sellstrom Fibre Glass helmet for EVERY welding operation—all with one-piece compression-molded fronts. They are exceptionally tough and shock-resistant; lighter and more durable than ordinary Fibre helmets! Fibre Glass is a thermo-setting material—outstanding for heat-resistant and non-absorbent characteristics. These helmets retain their shape; can be cleaned and sterilized without warping. Equipped with either fibre or plastic Sel-O-Matic fast-acting ratchet type headgear.

Write for brochure No. 32G which gives complete information and prices on the Sellstrom Helmets. (Distribution in all important cities.)



Sellstrom Manufacturing Co.

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joint. And when a man comes in, reports his injury, is x-rayed, and no fracture is found, we all have the tendency to tell him he has "just a sprain."

Anybody who has had a *real* sprain will testify to this: you can diagnose a sprain, but you never diagnose *just* a sprain any more than you diagnose *just* a *touch* of pregnancy. A sprain hurts just as much, is just as disabling, and takes just as long to heal as any fracture. The man

who has been led to believe that he is going to be well by tomorrow is going to take a pretty dim view of his informant, and then wonder if he didn't really have a fracture.

One other way in which everyone tends to increase disability (or potentiate claims) is by leaping at conclusions about the cause of something or other. As a case in point, I might mention a man who reported to us that they were doing some extra heavy work and

he began to have a severe pain in his back. It must have been due to the work. This was confirmed by his associates and foreman.

It was obvious that the man was having pain, but there was another small item involved. The man had been having urinary trouble for eight hours. He had passed blood and been nauseated. When we finally forgot the so-called injury, any medical student could have diagnosed his kidney stone.

There's another way of potentiating disability. Injured men, especially with fractures, feel that when the splint is taken off their symptoms should disappear. Regrettably this is not so, and we tell them so. We tell them not to be surprised if they have symptoms around the site of the fracture for as long as a year. Then, when the finger starts to hurt when the weather changes they aren't worried.

I have told you nothing new or startling or magic. I've merely mentioned some of our gimmicks for minimizing disability, and some observations regarding the creation of major injuries.

So, if I've said anything worth remembering, I hope it's this:

- Call injuries as you see them.
- Admit that injuries hurt.
- Don't be horrified.
- It takes longer to get over an injury than it does to get it.
- Finally, consider production in the same light as you would consider it if you had been injured.

Beg Your Pardon!

Credit for the safety coupling for trailers illustrated in January's "Sammy Safety's Notebook" was inadvertently omitted. The idea was developed at the Iola, Kan., plant of the Portland Cement Company.

Ideals are like stars; you will not succeed in touching them with your hands, but like the seafaring man on the desert of waters, you choose them as your guides, and following them, you reach your destiny.—*Carl Schurz.*



SAFETY HAT. . CAP with full floating HEADGEAR . . . adjustable sizes 6½ to 8

Molded, from a flame retardent, waterproof material in seven different brilliant, permanent colors—red, yellow, blue, white, grey, green, brown—"SUPERGARD" exceeds all Government Specs. for impact, penetration, electrical resistance, flammability, etc. . . . In the various adjustments, each change is positive and secure. Cool and well ventilated, for wearing in the sun—"SUPERGARD" is also supplied with a half-liner for frosty weather and a full-liner for frigid temperatures. There is no metal of any kind in its construction.

Easily sterilized, there is nothing that need be replaced in "SUPERGARD," when it is reissued, but the wrinkle free sweat-band which comes in leather or leatherette . . . "SUPERGARD" is also available with goggles; faceshield; welding helmet . . . Send for completely descriptive catalog page and prices.

The BOYER-CAMPBELL Company

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Wire From Washington

—From page 62

an international report giving a worldwide survey of measures against dust; and (3) that ILO compile separate codes of good practice relating to dust prevention and suppression in coal mining, metal mining, tunnelling and quarrying.

Air Safety. Year-end estimates for 1955, released by the Civil Aeronautics Administrator shows that the safety record of domestic scheduled airlines was estimated at 0.75 passenger fatalities per 100 million passenger-miles flown. The comparable rate for 1954 was 0.09, and 0.56 for 1953. United States international lines had a rate of 0.04 fatalities per 100 million passenger miles flown in 1955, as compared with a rate of 0.06 in 1953 and no fatalities in 1954.

In an address on "The Administration's Program for National Transportation," the under secretary of commerce for transportation said, in connection with airways, that "the tremendous expansion of air commerce makes safety, including the construction and operation of airways, the major problem now confronting us."

"Our policies must be geared to safety," he said, specifically stressing safety in the air. Owing to what he called the "traffic crisis in aviation," the under secretary said that "we are faced with major inadequacies in our comparatively inexpensive air traffic control system which affects the safety and defense of our people."

The International Labor Organization Governing Board has decided to call a meeting on the conditions of employment in civil aviation. Among the factors which will be considered are the safety-related question of hours of work of flight personnel.

Federal Government. The Civil Service Commission issued new regulations concerning the drivers of all Federal civilian vehicles. For the first time, a government-wide and uniform rule applies to the some 200,000 full-time government drivers, and the additional

300,000 part-time drivers, who drive the some 96,000 U. S. government civilian vehicles. The new rules require a physical examination every three years, under uniform and standard tests set up by the individual agencies, and with "adverse action" required for breaches.

The comptroller general of the United States, who heads the Government Accounting Office, issued a formal ruling stating that the General Services Administration

is authorized to include in advertised bid specifications a requirement that fire resistant and safety equipment be approved by nationally recognized private testing agencies. Where, however, the regularly established government inspection facilities are adequate to determine compliance with bid specifications, approval of such non-government laboratories may not be required because, said the comptroller general, it limits full and free competition.

Pointing the Way to More Effective Safety Promotion



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Ambassador's Notebook

—From page 94

ing yard and a marine repair shop.

In Caracas I addressed department heads and met company officials individually. Every possible courtesy was extended to me from my arrival until departure time. In fact, the red carpet was unrolled for me at the Miami airport where I was met by two Lago representatives and treated to

coffee by the resident manager of the Royal Dutch Airlines, whose service, incidentally, was exceptionally good.

Over-water drilling called for new techniques and presented some new job hazards. For example, concrete piles 196 feet long and weighing 165 tons are driven into the lake bed where they act as foundations for the drilling platforms.

The gas conservation plant, seven miles offshore from Tia

Juana, reinjects 137 million cu. ft. of gas daily into the earth where it is stored for future use. This has increased oil production by 50 per cent and effects an ultimate recovery of one-third more oil from the deposit. Going through this large installation I felt that I should be in my stocking feet; the areas were so clean. Such housekeeping is invariably accompanied by a good safety program.

Alaska

The Ninth Annual All-Alaska Accident Prevention Conference and Motor Vehicle Roadeo was held August 8-12 at Fort Richardson. I arrived at Elmendorf Air Base at Anchorage August 6 flying by Military Air Transport. Mrs. Dearborn arrived the same day traveling by Northwest Airlines.

Major General James F. Collins had invited me to speak at the opening session of the Conference arranged by Harold F. Gaasland, safety director, United States Army, Alaska. The technical subjects were very well chosen, as were the speakers.

During the week an organizational meeting was held to get the newly-authorized Alaska Safety Council started. Governor B. Frank Heintzleman of Alaska had invited me to participate in this conference. On August 14 Mrs. Dearborn and I flew to Juneau and while there I conferred with the Governor about the Council.

On our return stateside we stopped in Seattle where on August 16 I presented the Council's Grand Award for Traffic Safety to Governor Arthur B. Langlie. The presentation banquet was sponsored by the Washington State Safety Council.

Next stop was Duluth to attend the Governor's Annual Traffic Conference held under the auspices of the Minnesota State Safety Council. At the banquet I presented our traffic award to Governor Orville L. Freeman for first place among midwestern states.

Back in Chicago Sunday August 21, but aglow by the magnificent scenery we had seen, by the wonderful hospitality extended to us, and by the gratifying interest in accident prevention we had found.

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PERSONALS

News of people in safety
and related activities

ASA Elects Officers

H. THOMAS HALLOWELL, JR., president, Standard Pressed Steel Company, Jenkintown, Pa., has been elected president of the American Standards Association.

VAN H. LEICHLITER, vice-president of operations of American Steel and Wire Division of United States Steel Corporation, Cleveland, was elected vice-president of the Association.

Mr. Hallowell, 47, has been associated with Standard Pressed Steel Company since his graduation from Swarthmore College in 1929. He became plant manager in 1943, vice-president and general manager in 1948, and president in 1951.

Mr. Hallowell received the 1953 Industrial Relations Achievement Award of the National Metal Trades Association for his company's outstanding employee relations program.

Mr. Leichter, 50, became a metallurgist for American Steel and Wire on graduation from Penn State in 1930. In 1950 he was named assistant vice-president of operations, with headquarters at the Division's general offices in Cleveland. He became vice-president of operations in 1953.

Mr. Leichter is a member of the American Iron and Steel Institute, American Society for Metals, Wire Association, American Ordnance Association, and the Association of Iron and Steel Engineers.

LEWIS W. GREINER has been appointed manager of safety for the Explosives Department of Hercules Powder Company, succeeding John T. Moore, who retired December 31, 1955.

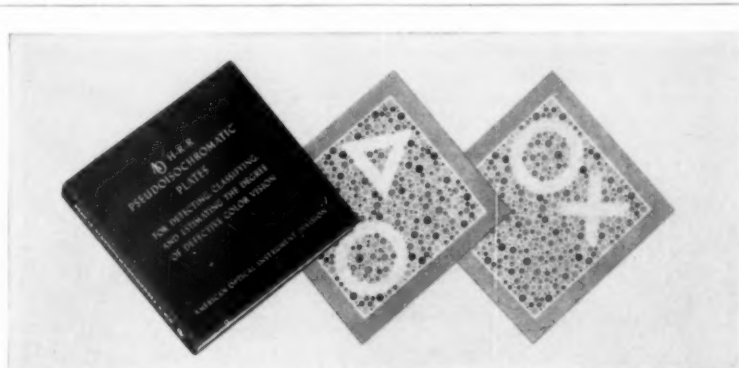
Mr. Greiner will be responsible for safety and fire protection in

operations at Hercules explosive plants and ordnance plants operated by Hercules for the U. S. Government, and in explosives sales, and sales service, and a consultant on safety in the storage and transportation of explosives. His work also covers the engineering of safety in explosives equipment for the manufacture (and transportation) of explosives.

Mr. Greiner has been assistant manager of safety for the Explo-

sives Department since his transfer to the home office in Wilmington, Del., in October 1953. Previously, he was assistant works manager of the company's Bessemer, Ala. dynamite plant.

A graduate of the University of Michigan with a B.S. degree in chemistry, Mr. Greiner left graduate school to become a chemist at the Hercules Experiment Station near Wilmington, in 1937. He was assigned shortly afterward to dynamite research at the Kenvil,



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Most Accurate and Comprehensive Low-Cost
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The New AO Hardy-Rand-Rittler color test answers a long felt need for an easy-to-give, comprehensive, low cost color blindness test. It is the result of more than ten years of scientific investigation, production and validation by eminent optical authorities.

It offers a simple way to insure job efficiency and prevent costly errors by rapid testing of workers whose jobs demand the ability to distinguish certain colors.

The test not only detects people who have Red-Green and/or Blue-Yellow color blindness but also types the deficiency and estimates

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To make color testing easy the new test has been designed for the utmost simplicity of administration. For the vast majority of people it is completed in seconds. Simple, detailed instructions and understandable scoring sheets are part of the test. The recognition symbols used . . . the circle, triangle and cross are universally understood and the ingenious pattern of the plates allows no clues for memorization.

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N. J. plant. In turn, he worked at the Carthage, Mo., and Hercules, Calif., explosives plants, before returning to the Bessemer plant as acid supervisor. He was appointed assistant works manager there in 1942.

GEORGE M. PROBST has been promoted to manager of accident prevention at Equitable Gas Company, with headquarters at Pittsburgh. In his new capacity, Mr. Probst will be responsible for

over-all direction and coordination of the accident prevention, welfare, and workmen's compensation activities. A veteran of 38 years with the company, he was formerly supervisor of safety and welfare.

In other appointments, HOWARD W. TAYLOR advanced to supervisor of safety and welfare, and ALEX GRAY moved up to supervisor of first aid training. Mr. Taylor will be responsible for safety training and inspections covering all departments in the Pittsburgh area,

including the distribution department. Mr. Gray will be in charge of first aid training for Equitable Gas Company personnel in Pennsylvania and West Virginia.

JOHN T. MOORE, safety manager of the Explosives Department of Hercules Powder Company, retired December 31. A veteran of 40 years of service, he was an authority on explosives safety engineering, including the fields of smokeless and black powders and high explosives.

Born in Decatur, Ohio, he started at the Kenvil dynamite plant immediately after obtaining his B.S. degree in chemical engineering at Purdue University in 1915. Mr. Moore was transferred to the Bacchus, Utah, dynamite plant a few months later. He returned to Kenvil in 1917 as assistant acid superintendent, and a year later was transferred to the Nitro, W. Va., explosives plant.

Following a period of service with the Explosives Department in the home office in Wilmington, Del., he held supervisory posts at the company's explosives plants at Emporium, Pa., then operated by Hercules, and became assistant superintendent there. He then returned to Kenvil as assistant superintendent.

In 1937, Mr. Moore was transferred back to the Safety and Service Department in Wilmington, as safety engineer, and four years later was made safety manager of the Explosives Department.

Mr. Moore is a member of the American Society of Safety Engineers and the American Industrial Hygiene Association. He is a Mason, and belongs to the Wilmington Country and Hercules Country Clubs, the Hercules Club of Wilmington, Hercules Quarter Century Club, and the Separators.

GLEN L. BUTLER, JR., has been named director of safety and security for The Ohio Boxboard Company, Rittman, Ohio. He comes to Ohio Boxboard from the Ford Motor Company's Brookpark plant at Cleveland, where he has been safety engineer the past

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two years. Prior to his association with Ford, he was safety engineer for the Cadillac Tank Plant, Cleveland.

He is a native of Lakewood, Ohio, where he attended Lakewood High School. A veteran of World War II, he served with the U. S. Army and the Army Air Force.

FRANK A. GERARD has been named safety manager for Olin Mathieson Chemical Corporation. Previously supervisor of Employee Services at the East Alton (Ill.) plants, he will be located in the company's New York offices.

Mr. Gerard has spent most of his career in safety promotion work. He was first with U. S. Steel Corporation as assistant safety engineer at their Duluth, Minn., plant. He has held other safety positions with Du Pont, Briggs Body Corporation, Square D. Switch Company, and the



Frank A. Gerard

State of Minnesota. He joined Olin Industries, Inc., in 1942.

Mr. Gerard is a member of the Metals Section of the National Safety Council, vice-president of the St. Louis Chapter of the American Society of Safety Engineers, and vice-president of the Madison County Safety Council.

He was recently appointed by Governor Stratton of Illinois to serve as a member of the Safety Education Commission in the Division of Safety Inspection and Education in the Department of Labor.

HENRY E. WEBB, JR., has been appointed safety engineer for Westvaco Chlor-Alkali Division, South Charleston, W. Va. He will be responsible for safety and plant protection activities at the Food Machinery and Chemical Corporation affiliate, according to Fred M. Hardy, director of industrial relations.

A native of Ft. Wayne, Ind., Webb attended Joliet Junior College, University of Tennessee and Roosevelt University and holds a degree in psychology. He formerly was safety engineer for Argonne National Laboratories. Webb is a member of the Scientific Research Society of America and was a member of the research

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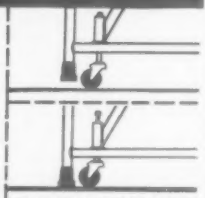
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Obituary

CARL A. SEARS

CARL A. SEARS, manager of motor transport loss prevention service for the Motor Transport Department of Liberty Mutual Insurance Company, Boston, died suddenly December 15. He was 60 years of age.

A native of Vermont, where he was special agent for the Attorney General's Office, Mr. Sears was loaned to the FBI during World War II. His outstanding record in the investigation of theft of interstate shipments of war material led to his connection with Liberty Mutual's Motor Transport Department as Cargo Loss Prevention Service Supervisor.

Mr. Sears was promoted to manager of all loss prevention service for this department in February 1949. He was a member of the National Advisory Committee on Fleet Supervisor Training and chairman of the subcommittee of that organization on development of curricula for the course in "Efficient Terminal Management." He also served as chairman of the Subcommittee on Truck Terminals for the Committee on Truck Transportation of the National Fire Protection Association and on many project committees for the American Trucking Associations' Safety and Operations Departments.

SAFETY ENGINEER

Wanted by Houston Construction firm. In replying give resume of experience and education and include recent photograph. P. O. Box 2132, Houston, Texas.

A tough drill sergeant was working during a hot afternoon session with a listless platoon. Finally he called a halt and shouted, "You guys think you're soldiers? Why, I've seen better drilling by little cans of beer on television!"

IES Celebrates Fiftieth Anniversary

CELEBRATING the 50th anniversary of its founding, the fraternity of American illuminating engineers, the Illuminating Engineering Society, will be examining and evaluating, during the next several months, its contribution toward making the United States the best-lighted nation in the world.

The self-analysis, designed to determine how the society can be of even greater service to its profession and its publics in years to come, began January 11 with a luncheon of its officers and a group of past-presidents at New York's Sheraton-Astor Hotel, scene of its birth on January 10, 1906. From a forward-looking band of 25 half a century ago, the IES has grown to an influential body of some 9,000 lighting men and women whose laboratory and field research, and whose astuteness in recognizing the public's needs in illumination have affected the lives of most U. S. residents and practically every industry and business.

Summed-up by the luncheon speakers, the society has helped bring more comfortable light into the home; more productive lighting to factory, mill, office and school; safer lighting to streets, buildings, mines and to all types of public transportation, and more effective and more adaptable lighting to the entertainment field.

Moreover, in an area that was still largely a mystery to some of the society's members 50 years ago, it has gone beyond the borders of conventional illumination to help develop "invisible light" as an agent in industrial safety tests no less than in police detection; to adapt the ultraviolet qualities of light as a tool of the physician, the food- and drug-producer and the fabric manufacturer, and its infra-red qualities as a device for the heating engineer and the physical therapist alike.

Be what nature intended you for, and you will succeed; be anything else and you will be ten thousand times worse than nothing.—Sidney Smith.

The School Shop's Needs

Inspection, instruction, and uniform reporting
are needed for a safety program to be effective

WAYNE P. HUGHES

THREE essentials of a good shop safety education program are: uniform accident reporting and analysis, regular and uniform shop safety inspections, and a program of instruction based on the hazards and safe practices of each area of instruction.

School shop records, unlike industry's, give us a very inadequate picture of the accident situation. Too few schools keep any records of student accidents, and most of those that are kept give information only on frequency and severity. We get a distorted picture of the accident situation in the shop area with respect to other areas of the school, with respect to one shop versus another, and with respect to one tool or machine with another.

For maximum value, accident reporting should be on a uniform basis, with regular analyses of the reports that will be reflected in the instruction program. We recommend system-wide use of the Standard Student Accident reporting program, available from the National Safety Council.

A safe environment is an essential part of the school safety education program. It should be needless to remind school people that they are legally and morally obligated to provide a safe environment, and the safe environment will exist only if hazards are discovered and corrected through regular and frequent inspections by school personnel—administrators, teachers, and students. Safety inspections determine if everything is satisfactory.

Inspections may be made at the

request of the board of education, the school administration, or upon the initiative of the teacher. Some communities have drawn upon the cooperative service of professional safety engineers, inspectors of state labor departments, insurance companies, and local safety councils to supplement and confirm inspections by school personnel.

In response to a major recommendation of the first President's Conference on Industrial Safety, the Joint Safety Committee of the National Safety Council and the American Vocational Association developed a National Standard School Shop Safety Inspection Check List to facilitate these inspections and pinpoint factors that need checking.

The check list is now available from the National Safety Council in packets of 50 for \$1.

Industry can make a worth while contribution to the schools of its plant community by providing a supply of these check lists to the superintendent of schools and offering to assist in school shop inspections.

Instruction is the backbone of the school shop safety education program. Most shop teachers incorporate safety in their teaching of the manipulative processes involved in shop work.

Industrial safety engineers might very well volunteer to discuss modern industrial safety procedures with shop teachers and/or students. Guided tours which highlight industrial safe practices also are helpful.

Anything industry does to improve safe practices and instruction in the school shop will pay dividends, for the product of the school shop is the future employee of industry.

WAYNE P. HUGHES is Director, School and College Division, National Safety Council.



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Portable Workstands

—From page 108

ordination. Certainly, working at heights on ladders and stands requires excellent balance.

We can do nothing about gravity, but we can certainly keep an eye out for the fellow whose balance is poor and keep him on the floor.

Perhaps the reason that we have had no general sessions on falls since 1938 is that it is difficult to develop a fresh approach to the subject. Nothing that I have told you is new. As a matter of fact, we can use the time-worn *Rules for Tools* and convert them to ladders and stands:

- Use the right tool (ladder).
- Be sure it's in good condition.
- Use it properly.

The President's Medal

Awards made by the National
Safety Council for successful ap-
plication of artificial respiration

WILLIE T. LAWLER, employee,
Lower Colorado River Authority,
Brenham, Tex.—drowning.

JOHN F. BLUM, comp. plt. oper.
—F.C.C.U., The Texas Co., Lock-
port, Ill., and J. W. GROVE, night
foreman—F.C.C.U., The Texas
Co., Lockport, Ill.—gas asphyxia-
tion. Certificates of Assistance to
RAYMOND KOZLOWSKI and SEBAS-
TIAN A. CERVELLI.

M. R. ROWAT LINE CONSTRU-
CTION CREW, The Hydro-Electric
Power Commission of Ontario,
Dunbarton, Ontario, Canada—gas
asphyxia. Certificates of As-
sistance to L. M. BERARD and EL-
WOOD FLYNN.

CHARLES T. FREEMAN, journey-
man lineman, Missouri Power &
Light Co., Moberly, Mo.—electric
shock.

ANDREW A. BIORN, cement con-
struction, Connell Sand and
Gravel Co., Connell, Wash.—sus-
pension of respiration due to fall.

STELLA I. McCOWEN, employee,
Michigan Bell Telephone Co.,

Benton Harbor, Mich.—drowning.

WAYNE E. WILLIAMS, instru-
ment maintenance man, Appala-
chian Electric Power Co., Hans-
ford, W. Va.—drowning.

WALTER F. BERGEN, cable splicer,
New York Telephone Co., Free-
port, N.Y.—electric shock.

B. R. HARRINGTON, lineman,
Nashville Electric Service, Nash-
ville, Tenn.—electric shock.

ENOS R. EDDY, agricultural gar-
dener, University of Illinois, Ur-
bana, Ill.—electric shock.

JAMES ED STUCKEY, service sta-
tion operator, Longview, Tex.—
drowning.

WILLIAM D. HAGGERTY, electrical
supt., Columbia River Construc-
tors, Bridgeport, Wash.—electric
shock.

ASTM Committees to Meet in Buffalo

THE AMERICAN SOCIETY for
Testing Materials will hold its
1956 committee week and spring
meeting at the Hotel Statler, Buf-
falo, N. Y., February 27-March 2.
More than 250 ASTM technical
committees and their subcommit-
tees are expected to meet during
the week to discuss and review
the work they have done during
the year in preparation for the
completion of their year's work
to be reported at the annual
meeting in June.

The only non-technical event of
the week will be the dinner and
entertainment on Wednesday eve-
ning, February 29, planned and
sponsored by the Buffalo District
Council.

At an all-day technical session,
Wednesday, sponsored by Com-
mittee B-8 on Electrodeposited
Metallic Coatings, a symposium
will be presented on the "Prop-
erties, Tests and Performance of
Electrodeposited Metallic Coat-
ings." Eight papers written by
outstanding authorities in their
respective fields will be presented.
All those interested are invited to
attend the symposium and to take
part in the discussion.

Industrial Nurses to Meet April 23-26

THE FOURTEENTH ANNUAL Con-
ference of the American Associa-

tion of Industrial Nurses will take place at Convention Hall, Philadelphia, April 23-26. The conference is held in conjunction with four other participating groups of the Annual Industrial Health Conference—the Industrial Medical Association, American Industrial Hygiene Association, American Conference of Government Hygienists, and the American Association of Industrial Dentists.

The theme for the 1956 AAIN Conference will be "What Is Industrial Nursing?" A comprehensive educational program has been planned to answer this question for nurses, physicians, management, labor, and other interested groups.

There isn't a plant or a business on earth that couldn't stand a few improvements—and be better for them. Someone is going to think of them. Why not beat the other fellow to it?—*Roger W. Babson.*

Hard Hats New to Russian Builders



RUSSIAN CONSTRUCTION EXPERTS get an eye-opening lesson in American skyscraper construction methods on New York's new 45-story Socony Mobil Building. Here, Turner Construction Company guards introduce the Russian authorities to safety hard hats, mandatory on such construction projects in the United States, but unheard of, according to the Russians, back home in the USSR. The group had asked permission to visit the building, the world's largest stainless steel skyscraper, to learn first-hand of American architectural use of stainless steel, a scarce metal in Russia where it is reserved for essential use.

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suction picks up every drop of moisture. Combustible material removed easily and safely. Moisture in air stream cannot damage specially-designed HILD By-Pass motor. Wet and dry pickup accomplished without adjustment or change of filters. Powerful ¼ H.P. explosion-proof motor operates on AC or DC. Safety electric switch by Appleton. Hose and caster treads made of static conductive rubber. Model 306—6 gallon wet or ¼ bushel dry capacities. Model 315—10 gallon wet or 1¼ bushels dry capacities.



HILD CX EXPLOSION-PROOF SCRUBBER-POLISHER

A multi-purpose machine. Used with easily interchangeable attachments to scrub, wax, polish and buff floors of all kinds. Motor and Appleton safety switch are totally enclosed. Bumper and wheels made of static conductive rubber. Spark-proof copper mesh cable used between connector and motor. Brush spread in popular 16-inch size.



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The 'Accident Prone'

—From page 110

taxi drivers, and general motorists.⁶ They found that the accident-prone groups were aggressive, impulsive, unable to tolerate authority, and maladjusted socially. Himler substantiated these findings in a review of personality patterns of industrial accident-prone workers.⁷

In a carefully conducted study,

Whitlock and Crannell compared two groups of workers from the same departments, carefully equated in terms of age, number of dependents, weekly wage, length of service, and education, and differing notably in accident involvement.⁸ No significant relationships were found between scores on the Bennet-Frye Mechanical Comprehension and the Otis Test of Mental Abilities, and occurrence of accidents. Results on the Bernreuter Personality In-

ventory Scales indicated that "... accident cases appeared less 'neurotic,' less 'introverted,' and more 'self-confident.'" The investigators called attention, however, to the small number tested and to the wide overlap among both groups in these traits, and cautioned against unqualified reliance on personality assessments by means of inventories.

Holmes found the median aptitude of an industrial accident group below the norm for all workers in his study.⁹ No significant relationships appeared between accident proneness and supervisors' ratings of such employees.

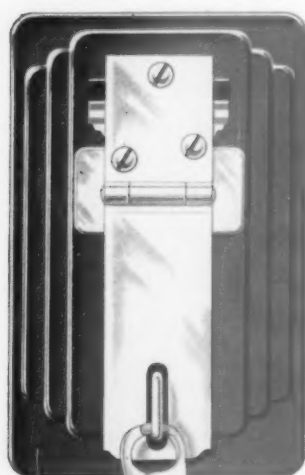
The Worthington Personal History, a projective test designed as a job application blank and administered to 54 accident-prone workers by LeShan disclosed strikingly similar patterns including superficial ties with others, tension over health, attempt at upward social mobility, hysteroid blocking out or distortion of stimuli, aggression toward authority, and poor erratic planning for the future.¹⁰

Undoubtedly the basic difficulty of many studies lies in the failure to differentiate the accident prone from the accident repeater. The concept of accident proneness suggests a predisposition to accidents due to some physical or psychological characteristics of the individual. It assumes that the accident-prone person is an accident repeater. Yet many people may fit the personality pattern without experiencing repeated accidents.

Likewise, others may have been involved in a number of accidents either by virtue of increased exposure or by chance expectations of normal probability (as indicated by Mintz and Blum) without being predisposed to accidents.

Still others may occasionally display accident-prone characteristics as a result of temporary stress, and become responsible for a number of accidents during a short period of time, thus further confusing the evidence by "normal" behavior and disposition while participating in these studies.

Investigators must consider these distinctions and these dis-



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tractions in their attempts to identify the accident prone, determine his relative effect on the total accident problem, and suggest suitable measures to cope with this aspect of the problem.

With respect to the second question of accident prevention, Brewster emphasizes emotional factors underlying and precipitating accidents.¹¹ He notes that "such events bringing unexpected harm to oneself or other persons seem to fulfill an unconscious need to punish due to feelings of anger and guilt. There is evidence to substantiate the view that high-accident individuals have a distinctive character pattern which is a causative factor in the accident."

Himler also associated emotional disturbances with accident proneness and sickness absenteeism, and reported that "... evidences of increased worry and tension were seen in five areas of personality function: appearance, habits, attitudes, feelings and emotions, and general behavior."¹²

Without underestimating the importance of individual therapy, Kerr suggests that the attack on accident liability be re-directed from personality conditions predisposing to accidents to the total psychological climate of the group.¹² Any proneness or liability to accidents may well be "... a group psychological phenomenon as well as an individual phenomenon."

This hypothesis is supported by evidence that some factory departments have had unusually high accident rates even after years of intensive efforts to improve the situation. A study by Kerr of 53 accident prone and non-accident prone departments in the Camden Works of RCA involving 12,000 employees during 1943 indicated that "accident frequency is associated with low intra-company transfer mobility, small per cent of employees who are female and on salary, low promotion probability, and high noise level; accident severity is associated with predominant male-ness, low promotion probability, low fertility of suggestion field, low suggestion record, non-youthfulness of employees, and high average tenure of workers."

The investigator proposed that the key to the reduction of industrial accidents demands a "fundamental change in the total psychological frame of reference in which the average employee works," so as to reduce the probability of accidents, and with attention to provision for "more emotional reward goals as incentives to raise the average level of alertness."

Kerr, Keenan, and Sherman

explored these suggestions in a study of 44 shop departments in a large industrial plant.¹³ They tentatively concluded that promotion, comfortable shop environment, and degree of crew work probably encourage safe behavior; incentive work apparently has little effect; where obvious danger exists, accidents that occur do not involve that danger directly, but instead, the hazard contributes to other accidents by focusing atten-

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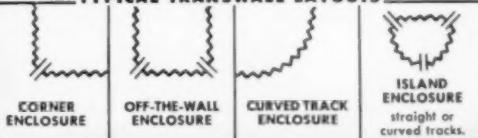
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tion on itself and away from other dangers.

While the number of persons who are actually accident prone is probably much smaller than previously estimated, there can be little question that some individuals have a predisposition to accidents beyond that expected in a normal probability distribution. However, the difficulty of identifying the accident prone, and the apparent shifting of persons within the group, justifies a re-direction of emphasis suggested by Kerr and his colleagues from individual personality to sociological considerations as a means of reducing the personal, social, and economic cost of accidents in modern living. Increasing public concern with the accident problem will stimulate further investigation of the accident prone and throw new light on this interesting group.

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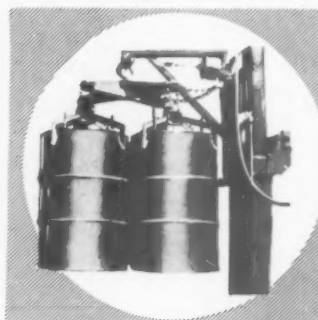
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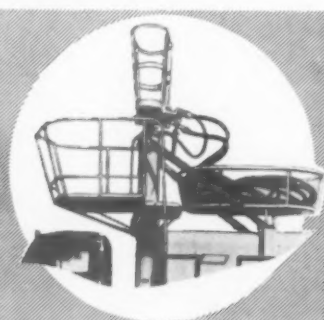


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Diary

—From page 14

to threaten resignation. We might have to resign, he admitted, but then we would simply resign, not threaten, not dramatize. "I don't want this job badly enough to have to hold it by threats," he said.

Norden wasn't ready to buy that idea, not at first. But Danert clinched his point by saying, "Look, we're not office boys. I've got connections at Eastern (the company which holds financial control of Exsteel). You were both picked by Eastern representatives, not by Johnson. There are some others like us who will, I think, commit themselves for us. If we avoid giving Johnson the argument that we are a discontented opposition clique, he will be very slow to buck us all. Curiously enough, a victory for our position will really strengthen, not weaken, Johnson with East-

ern, and I think he's smart enough to see it if we can avoid a crisis while he's scared."

* * *

During the following week, each of the three of us was invited to dinner or luncheon or to in-the-office talks with department heads who felt we were being unwise. We were bombarded (individually, not as a group) with arguments in favor of going along with Johnson's wishes.

At the end of that second week, when we met again for dinner to compare notes, Johnson brought along Louis McStail, the comptroller. A lot of the talk that night was over my head—lineups of financial groups within Eastern, bonded indebtedness, and the like.

But some of it wasn't over my head—it was photographically clear. Our radical reorganization of Exsteel in '55 had increased operating costs eight per cent, and had produced no increase in income. It had changed a piddling profit down to an alarming loss.

Yet, when the talk ran down close to midnight, and the nightcaps had been poured, Louis had said,

"I use figures as tools. With them I can hammer down the rivets that tie an organization together, that bind it to a sound program. I have to have good tools. I think you men have been asked to mislead me—to mislead the company—with very bad figure tools indeed. I hope you will refuse. Count on me as with you."

* * *

And in the week that followed I was approached by Joster, the assistant sales manager, with an offer of help. I asked Danert about that, and he said, "No. Not now. I don't want any assistant department heads. There are only two possibilities with such a man. Either he is trying to worm his way into our party to report on us or he is ambitious to cut his chief's throat by joining us against him. In some situations, we could

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use such a man. Not in this one. If there's to be a nasty, open fight, we aren't going to start it."

Johnson never did call me in—perhaps only because I was the least important of the rebels. He did talk at length to both Danert and Norden—to the first appeasingly, to the second threateningly.

Norden was white with anger afterwards. "I did what you told me to," he said to Danert and me. "I kept my temper. I didn't threaten. But, damn and blast, it was hard. If it wasn't that we'd agreed, I'd have thrown that job in his face and made him eat it."

Danert smiled, "And by that, you would have accomplished—what?"

Norden growled, "You're right, but it was hard. Damned hard."

Danert said, "Hold on another week. It'll all be over then." He wouldn't explain that remark. But in the last of our caucuses at the steak house, the personnel manager and the promotion manager were with us, along with McStail.

All this took more time than appears from the telling. But the really time-consuming part of the month's work was the preparation of the analyses of past performance and the proposed departmental budgets. For Danert insisted that while we remain stubborn about complying with unreasonable requests for estimates we do the very best job we could of analysis and future planning to make our position bullet-proof in the climactic showdown.

I can honestly say that I've never before done as good a job in this field as I've done since the conflict started.

Suddenly, this afternoon, the climax came. All yesterday, Johnson was in conference with McStail, Danert, the sales manager, and the office manager. The little stenographer gals kept looking anxiously at the door. The phone calls were cut off. And I, my final report and budget having been delivered by messenger, not in person, went home in fear.

* * *

This morning, the delegation from Eastern arrived—three men, with briefcases and homburg hats and blank, but very wise, faces.

They spent an hour alone with Johnson. They spent two hours more with Johnson and the four others of yesterday's conference. I made some bluff of working on my monthly statistical report, but it was no go.

After lunch, there was a full dress meeting of the whole executive staff—all department heads and several assistants and sub-department chiefs.

And climax, hoped for, dreaded, dreamed of, collapsed into the anticlimax of the professional smooth-out job.

Johnson made a speech thanking us all for our cooperation and our analytical reports and our integrity. He spoke feelingly of the difficulties we had shared with him in tackling a mare's-nest situation and beginning the clean-up. He spoke sternly and yet optimistically of the magnitude of the job ahead of us, and the need for clear and realistic evaluation and planning. He thanked the Eastern representatives for their support and helpfulness in clarifying the situation. Then he sat down.

Next, Danert spoke. He complimented Johnson on his enlightened and courageous leadership, his patience and firmness, his far-sightedness and down-to-earth practicality. He, too, thanked us and the Eastern men for support and constructive guidance. And he sat down.

Finally, the senior Eastern representative made a smooth, clubman-type speech congratulating Eastern on having such a fine team of strong-willed, capable, thoughtful men as we were. When he finished that speech he didn't sit down. Instead, he gave a shrug, and you could almost see clubman pose drop off like an overcoat, and the hard voice of a heavy-jowled, old-line industrial superintendent snapped,

"So you've had a row! All right. Nobody won it. Nobody lost it. Nobody sulks. Go on back to work and make this plant pay out before I get sore and break somebody's neck. Good luck to you all!"

And that, amazingly enough, was all that there was to it.

And I'm free again to walk the plant floor and try to keep people from getting hurt.

Chain Hoists

—From page 23

completion of a job and hoists sent back as defective by on-the-job inspection should receive the following:

1. Chain inspection as above.
2. Hook inspection as above. Replace, don't reshape hooks.
3. Remove handwheel, examine brake parts, including pawl, galvanized iron disc, ratchet disc, and leather disc. Replace worn parts. Also check the pawl action to see that it properly engages the ratchet disc. A new pawl spring may be indicated.
4. Remove gear cover and examine gears for wear.
5. Knock out driving pinion and examine for twist or damage. If the straight oil groove along the length of the driving pinion is twisted, replace the pinion.
6. If chain has been stretched, look for worn load sheave pockets. If the pocket shoulders are worn down, replace sheave.
7. Stretched chain indicates worn load chain guide and stripper. You should have $\frac{1}{4}$ " clearance between load chain guide side and the outside diameter of the load sheave.

Now that you've been inside the hoist, replaced worn parts, and reassembled the hoist, we are ready for the 50 per cent overload test, which brings us to our next control—testing.

Testing

Testing a hoist without internal examination is like an ostrich sticking his head in the sand. This is no protection at all.

Picture a pawl that is worn, and a pawl spring that is weak. It happens to engage the ratchet disc during your test, but when it gets on the job it misses. This and other borderline defects can pass an external test; examination of inside working parts should be made first.

Most manufacturers load test hoists to 50 per cent overload on a long ton basis. There are several testing methods. I understand one of the yards is getting a hydraulic loading device. Others have a type of strain gauge. Regardless of the type, I would strongly recommend that you actually operate the hoist under 50 per cent overload.

Maintenance

The usual recommendation for

the frequency of complete inspection of the chain hoist in normal shop use is:

Severe or continuous service, once a week. Frequent daily service, but not continuous, once a month.

Average or partial daily service, every three months.

However, in shipyards, due to the nature of the work, overloading is so likely to occur, and damage from dropping or rough treatment almost bound to occur, that I would recommend a complete checkup, repair, and test each time a hoist is returned to the storage area.

Good maintenance pays dividends in longer hoist life as well as giving protection to the user.

How long would your car motor run without oil? The first stroke of the piston would start the wear on the cylinder wall. The motor would last a few miles and then—the junk heap. Your hoist chain has moving parts, steel against steel. Without lubrication the wearing time is $\frac{1}{20}$ th the life of a lubricated chain.

If you allow stretched chain to stay in use, you create excessive wear on more expensive items, such as the load sheave. The load chain guide and stripper will also wear out fast. So you don't save by keeping worn or stretched chain on the hoist.

Another unsafe practice is the reshaping of stretched hooks. A stretched hook will usually show cracks or faults on the inner hook surface that has been under tension; the outer surface has been compressed. Now, when you reshape the hook, you reverse this condition, i.e., inside under compression and outside under tension. These cracks do not disappear; the reheating does not eliminate these weakening defects—they are still there. Furthermore, the reheating itself is apt to take away the effect of the original heat treatment, giving you a soft weak hook. It's just not worth it. Why gamble with lives and equipment to save the price of a hook?

I have been asked about annealing. Some yards periodically anneal hooks, chain, shackles, etc. Speaking only of hand hoist hooks, don't do it! (Turn page)



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Annealing started back when wrought iron was used both for chain and hooks. Its purpose was to relieve the work hardening on the wearing surfaces. In the case of wrought iron, annealing did not weaken the material.

For today's steel hooks and chain, majority of which are heat treated for strength, annealing is wrong. The effect of work hardening on steel has never been found to a detrimental degree. Annealing serves no purpose but to take out the effect of heat treating, giving you a soft, weak material.

Using the Hoist

There is more to this hoist problem than mechanical maintenance, however. There is the human problem. The shop may do a fine repair job, but what about the cause of the damage in the first place?

When hoists are thrown 30 feet over the ship side to the dock, when the hoist is overloaded six times its rated load, when the hoist is left in three inches of water overnight, you can see some other control is needed.

When a man is not held responsible for equipment, he tends to neglect it.

As painful as it may seem to some, the keeping of records will go a long way toward controlling this attitude. When the user knows hoist No. 62 is assigned to his crew and that it must be checked in when he's through with it, he knows that the condition of the equipment is his responsibility.

Record keeping can be simplified by using a repair parts check sheet form with space on it for comments, dates out and in, number of hoist, name of user. Each hoist should have a number permanently marked on it.

These records will help you to analyze the hoist problem. They will show the job, the crew, and what damage was done to each particular hoist. Records will also indicate which make hoists hold up the best.

A meeting of leaders to educate them on hoist inspection might be a good idea. This could be arranged through the safety de-

partment, with the safety engineer instructing, or jointly by both safety and hoist repair departments. The very act of giving hoists special consideration by a meeting of this kind will give the hoist more respect by the men who use it.

The control of overloading and other misuse, again will depend on the "on-the-job" inspection by the safety department and the crew leaders.

It will be up to these men to spot misuse and correct it.

One of the age-old problems in ship repair work is the lifting of shaft sections. This is a particularly difficult application because of limited headroom and the positioning of the gear required.

The usual method is to hang the hoist to one side of the shaft from an overhead beam, run the load chain under the shaft, and dead end it on the other side of the shaft to a second beam. When the load is lifted, they get a theoretical 2:1 mechanical advantage. This seems to be one of the necessary evils of ship repair. However, the dangers produced can be minimized.

The first danger is produced by the angle of the load chain with the horizontal. The greater the angle, the smaller the chain capacity. For example, if you use a 3-ton hoist, you don't have 6 tons with this arrangement as some think, you have a fraction of 6 tons, depending on the angle of the chain. At 30° angle you would have only 3 tons instead of 6 tons.

To reduce this hazard, first set your supporting shackles as close together as possible to increase the angle of your load chain with the horizontal giving you maximum chain capacity. Second, select your hoist capacity, not only by the weight to be lifted, but also taking into consideration the angle of pull with which you have to work.

Another lesson here should be applied on all jobs. First, the load chain of the hoist should not be used as a sling chain to cradle the load where this can be avoided. The reason is twofold. You are likely to strain links by bending or twisting with this side thrust; the links also may become scarred or mutilated in such a

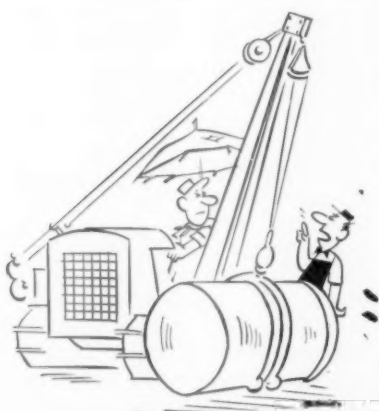
way as to reduce their cross section. The saying is still true, "The chain is as strong as its weakest link."

This mutilation of the link is particularly true where the object cradled is square or flat in cross section, i.e., has sharp corners.

To reduce chain damage heavy canvas pads may be placed between chains and load to protect both the chain and the piece being lifted. This pad also helps to spread the load on the chain and to prevent abrasive wear on the chain. It is also suggested that the chain be heavily greased.

Following is a brief summary of suggestions for the safe use of chain hoists:

1. Inspection of hoist on the job by crew leaders and safety inspectors.
2. Complete inside and outside inspection each time hoist is brought in from job.
3. Test to 50 per cent overload after complete inspection.
4. Assign numbers and keep records of hoists including description of repair and record of user.
5. Take the angle of pull into consideration in selecting size of hoist for job.
6. Protect load chain from damage when used as cradle or sling by use of pads.
7. Don't use the hoist chain as a sling or cradle unless there is no other way.
8. We do not recommend reshaping of hooks.
9. Give importance to "the proper care and use of the chain hoist" by holding meetings with your leaders and safety department.



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Living With the Atom

—From page 21

we not have enough confidence in ourselves to say that within our lifetime at least one per cent of our present capacity will be replaced by nuclear power? That is, after all, only 1,000 megawatts—the equivalent of the output of Grand Coulee dam, and surely within the integrated combined ability of American government and American industry.

But if we have 1,000 megawatts of nuclear electrical power, we must have generated even under favorable thermal efficiencies at least 3,000 megawatts of heat power, and therefore at least 150 megawatts of radiation power. One hundred fifty megawatts of radiation power is really quite a tremendous amount of this unique type of power. A one-watt bulb gives a barely perceptible amount of light. Yet exposure to one watt of gamma rays would kill a man in less than an hour. Ten kilowatts of radiation power would be enough to pasteurize the average food requirements of an army division. One megawatt of gamma power could polymerize as much styrene as is now being produced by other means throughout the entire country. For average applications 10 kilowatts would be sufficient radiation power to equal typical production capacities. On the average, then, 15,000 factories or applications could be maintained by our projected national capacity of 150 megawatts.

I, for one, am convinced that the limiting factor to the successful industrialization of radiation power will not be a matter of supply. Nor will it probably be primarily a matter of cost. Radiation power will always be a by-product or waste product of atomic power, and as such its cost will be adjusted to meet market demands.

If supply and cost are not the limiting factors, how about the hazards of handling radiation power? This is indeed a problem and one certain to add to the cost of our project, but that the problem can be surmounted is attested to by the considerable success the AEC has had in operating

and maintaining its facilities.

The main feature of the problem is that radiation and radioactive materials are biological hazards. Operating personnel and the public must be protected both from the penetrating radiation and from the remotest possibility of ingestion of radioactive material. Basically, we must learn to live with the atom while we use it, and keep it from harming us, just as we have learned to live with fire. Industry is replete with examples of how hazardous materials have been handled. Explosives, acids, high voltage currents, and bactericidal agents have been confined where they will do their work without harm to the user. Indeed, we are more fortunate than the organizers of earlier industries using hazardous materials in that a governmental agency has already set up a wise and farsighted policy governing the handling of radioactive materials and has already developed the technology for implementing that policy.

The question remains—what advantage does the use of radiation have over the use of more conventional methods? To gain a better insight into possible unique applications we must first look a bit more deeply into the fundamentals of what radiation is and how it interacts with matter.

Radiation can initiate chemical reactions much in the same way that a catalyst can. Quite a few such chemical reactions have already been under investigation and are the basis for the growing science of radiation chemistry.

Although radiation can be used to effect simple chemical reactions, such as degradations, the yields are ordinarily so low as to make this application obviously uneconomical. For instance, the use of radiation as a brute force to rearrange molecules is not going to replace thermal cracking in the petroleum industry. Most of the work in the field is being done on the use of radiation to trigger chemical chain reactions where radiation has to supply only a small amount of initial energy to start the reaction and chemical energy carries it the rest of the way.

Polymerizations are systems of this sort. Bretton at Yale and Martin at the University of Michigan have demonstrated that ethylene can be polymerized at potentially commercially significant rates and at low pressures. This may be a new way of manufacturing polyethylene—a very important polymer.

Some Brookhaven work has demonstrated that important physical properties of some polymers may be changed by radiation. Polyvinylpyrrolidone is a blood plasma substitute. The present commercial variety has the disadvantage that a high molecular weight fraction does not pass through the kidney wall and is not metabolized. Radiation can polymerize this material at higher than the present commercial rates and form a polymer of such molecular weight distribution that the plasma properties are retained, but the high molecular weight fraction is not formed.

Graft copolymers can be made by radiation techniques. This is a method of joining or grafting two polymers together in such a way that some of the physical properties of the product are better than the individual properties of each polymer. For instance, vinyl acetate and acrylonitrile, two cheap plastics, can be grafted to form a copolymer that can resist boiling water. We may yet see hot water pipes made of this material.

The crosslinking of macro molecules deserves some further discussion. The General Electric Company has marketed what seems to be the first practical application of intense fields of radiation. This is a material called irrathene or irradiated polyethylene. The company has claimed that crosslinkage by high speed electrons has produced a material with more thermal stability and more mechanical strength than the unirradiated variety and is offering the material as a temperature-stable electrical tape.

Possible uses for crosslinked polymers range from plastic bottles that can withstand commercial sterilization temperatures to plastic blisters for jet aircraft that may maintain rigidity at ultra high speeds.

The chemist will recognize that only a bare beginning has been made in finding applications for this new mode of energy. Can we beneficially effect oxidations, sulfonations, halogenations, aminations, etc.? Can you depolymerize protein molecules? Can you degrade sugars? Can you supply free radicals for low-temperature reactions in non-aqueous solvents? These and many more such questions have yet to be answered by enterprising experimenters.

Biological applications of radiation represent another phase of this fascinating new business.

The basic facts of radiation biology seem to be that the more complex the biological organism, the easier it is to destroy by radiation. Thus it takes a whole body dose of about 400 R to kill a man, about 25,000 R to kill insects, and about 2,000,000 R to kill bacteria.

Behind this rough generalization lies a tremendous amount of not yet understood mechanisms. A large part of AEC effort in radiation biology is an attempt to evaluate the mechanism of the interaction of radiation with a seemingly endless variety of systems. There is also the blunt empirical approach on systems that apparently would have some practical value. For instance, the food technology groups at M.I.T., at the University of Michigan, at Columbia, and at other sites, have been trying for years to find if one can practically sterilize foods at low temperatures by the use of radiation.

What have they found out to date?

First, it is possible to sterilize any food by the use of radiation.

Second, the nutritive value of foods is affected only in a minor way by the amount of radiation necessary for sterilization.

Third, it appears that all food products undergo some degree of flavor change at the sterilization dose. Not all foods are as sensitive—milk is very sensitive; meat and fish moderately sensitive; cereal and bread are relatively insensitive to flavor change. However, today the major problem in the broad application of ionizing

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radiation to the treatment of foods appears to lie in this flavor change. Many attempts are being made to minimize off-flavors, and of these, pasteurization rather than sterilization seems to be most successful.

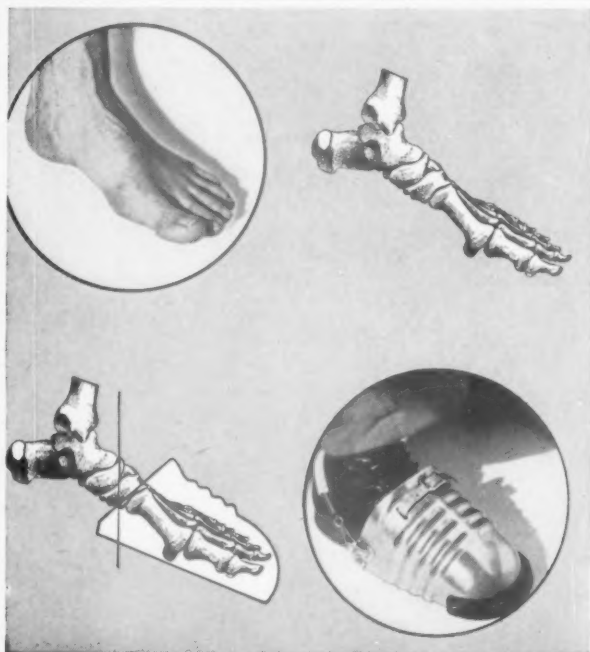
Fourth, workers have observed that dosages of the order of five to 30 times that required to destroy bacteria by radiation are required to destroy enzymes. Limited studies have indicated that the enzymes in meats, although still chemically active, do not produce significant deterioration upon storage at room temperature as would be ordinarily expected. Generally speaking, however, food products treated will have to be enzymatically controlled in some other manner.

Fortunately, many of the problems of food sterilization do not exist in drugs. We do not expect drugs to taste good, for example. Many years of work at the Upjohn Company, the Schering Corporation, and some recent work at Brookhaven have indicated that it is indeed feasible to sterilize heat-sensitive drugs with radiation. Whether or not it is practical depends primarily upon the availability and cost of suitable commercial equipment.

The use of light doses of radiation for useful biological reactions may find yet earlier application. Drs. Sparrow and Christensen at Brookhaven have found that doses of 10,000-20,000 R are effective in inhibiting the growth of sprouts on potatoes, thus greatly prolonging the storage life of the potatoes.

Drs. Hassett and Jenkins of the Army Chemical Center have reported on the use of radiation for insect control. They have found that doses of 65,000 R are quickly and completely lethal to a large variety of insect pests and thus would stop the damage of heavy infestation. Light infestations can be controlled by doses of lesser intensity which would stop reproduction.

This opens up the possibility of controlling insect infestation in food, clothing, and wood products, a potentially valuable use indeed, since estimated yearly damage to stored products in the United



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States alone is over one billion dollars.

If there really is to be a new radiation industry, a tremendous task still lies ahead. Basic research information on the interaction of radiation with chemical and biological systems is needed. Considerable development work will be required before commercial sources of nuclear radiation will be available.

Even then operating personnel must learn the intricacies of remote control and remote maintenance. I am confident, however, that these tasks will be accomplished and a place in America's industrial family will be found for these non-power applications of atomic energy.

Warns Against Using Flood-Damaged Boilers

A WARNING against premature use of high-pressure boilers submerged in the recent floods was issued by Ernest B. Webb, director of the California Department of Industrial Relations, who gives the following reminders.

No boiler whose foundation, setting, or attachments has been under water should be used again until a certified boiler inspector determines that the foundation has not been weakened or undermined, and that the attachments and controls have been cleaned and checked and are in safe operating condition. Any brickwork and baffles should be thoroughly and slowly dried.

Sources of water supply for boilers and water filters, heaters, etc. should also be checked to prevent the introduction of mud and other foreign material into the boiler.

Boilers should be operated only at low ratings and should be opened for cleaning at frequent intervals until it is determined that all detrimental factors resulting from flooded conditions have been eliminated.

All automatic controls and electrical equipment used in operation of a boiler should be thoroughly checked, and should be operated under close attendance until they are definitely known to be in proper operating condition.

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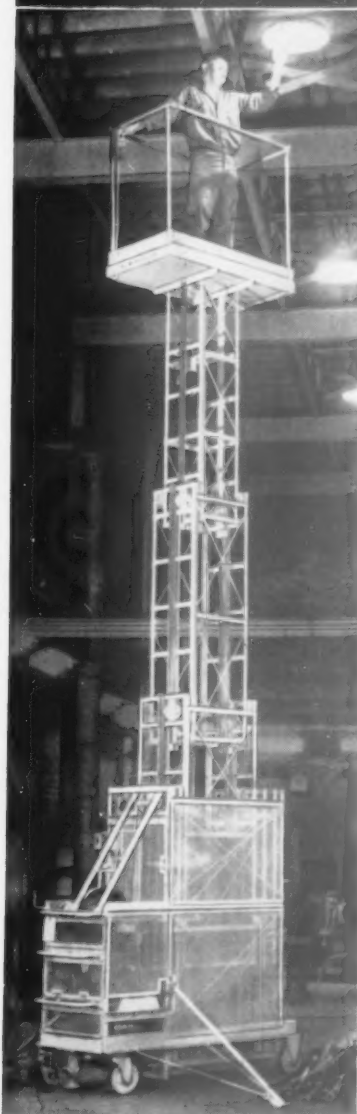
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Corrosive Irritants

—From page 25

ing solvents or solutions would be advantageous but operators can waste critical time seeking these solvents and, in general, flushing will perform the same function even though it takes somewhat longer.

Solid Irritants

Solid irritants depend largely on their action with moisture on the skin or other surfaces. These irritants can cause serious damage to the skin, both from their corrosive action and from their thermal heats of solution. This class of irritants is probably the least hazardous because normally a worker has sufficient time to remove this material from exposed body surfaces before serious irritation occurs. However, in many cases the irritant is a liquid slurry of organic materials and in this case, the potential irritation is as bad as in liquid materials.

Solid irritants can cause delayed irritation. This can occur when a worker gets solid material on his skin without his knowledge or from carelessness in removing this material. Solid irritants, such as the caustic alkalis, are not immediately painful like the acids and if left in contact with the skin until pain is felt, serious burns may result.

Examples

CAUSTIC ALKALIES

- Alkaline sulfides
- Sodium hydroxide
- Sodium carbonate
- Sodium silicate
- Potassium carbonate
- Ammonium hydroxide
- Ammonium carbonate
- Barium hydroxide
- Barium carbonate
- Trisodium phosphate
- Lime (hydrated & dehydrated)
- Calcium carbonate
- Calcium cyanamide

ELEMENTS AND SALTS

- Elemental sodium
- Elemental potassium
- Elemental phosphorus
- Antimony and its salts
- Arsenic and its salts
- Chromium and the alkaline chromates
- Copper sulfate

- Copper cyanide
- Mercuric salts
- Zinc chloride
- Silver nitrate

Probably most serious of all this group of solid irritating materials are the caustic alkalis, because of the very wide application of these materials throughout many industries. This list includes only the most commercially important ones and the most severely corrosive.

A second group of solid irritants includes some of the elements and salts. This group contains many oxidizing agents, reducing agents, and elemental materials that produce irritation by thermal burns.

Solutions of these materials probably pose the most serious problem. However, fine dusts of any of these solid materials will sometimes cause severe chronic irritation, particularly in cases where workers perspire freely. This would include working in areas at elevated temperature and summer operations.

Monsanto's experience in handling solid irritants is similar to handling liquid materials, with the exception that solid materials in a finely-divided state frequently cause chronic irritation. Dust control is a necessary adjunct to finely-divided irritant handling. In the chemical industry, in almost every case where finely-divided solid irritants are handled, exhaust ventilation is provided. Employees working in areas that handle solid irritants within our company are provided with gloves, respirators, and protective clothing as the necessity arises.

In some cases where finely-divided irritants are used, protective creams are issued. We, however, do not depend entirely on the use of protective creams because we feel that they are not a substitute for good personal hygiene, and in areas where these materials are handled, showers and facilities for washing the hands and face are provided. When protective creams are used, instructions as to their application and removal are given, with reasons why they should not be substituted for personal cleanliness.

As far as first-aid procedures are concerned, we again recom-

mend copious flushing of the skin or eyes with water and the immediate summoning of a physician. It may be of interest to note that handling certain organic solvents, such as phenol, which has a melting point of 41°C., or lactic acid which has a melting point of 26°C., poses a problem characteristic of materials that melt in the general range of 25 to 50°C.

In ordinary chemical processing experience, these materials might be either liquids or solids, and in the case of phenol, the removal of the solid material from the skin is an absolute necessity if considerable material has adhered to the skin. We recommend that after copious flushing with water, soap and water be used to remove minute quantities of these irritants.

Here again, our experience has shown that good education as to inherent hazards involved in handling these materials and the safety procedures prescribed are the best methods for eliminating accidental exposure.

Gaseous Irritants

Although liquid and solid irritants afford considerable hazard from skin and eye contact, the most serious hazard associated with irritants in general is from these materials in the gaseous state.

Widely different symptoms result from the action of different irritant gases and vapors. These differences are due primarily to the differences in the localities on which the irritant acts. Symptoms of inflammation, therefore, are governed by the structures affected by the inflammation and not by any fundamental difference in the mode of action of the irritant substance.

The localities affected by gaseous irritants are influenced principally by the solubility of the irritant. For example, ammonia gas in high concentrations will cause intense congestion and swelling of the upper respiratory passages and possibly rapid death from spasm or edema of the larynx. If the immediate effects are survived, there may be little serious after-effects, since the deeper structures of the respiratory tract are not reached and harmed.

On the other hand, phosgene, even in concentrations that cause little immediate irritation, may later be fatal due to pneumonia or pulmonary edema through its action on the air cells of the lungs. Chlorine is intermediate in its action between ammonia and phosgene, due to its intermediate solubility.

The selective action of the irritant gases in the respiratory tract determines the relative danger of death from them. The deli-

cacy of the respiratory membranes, their susceptibility to injury, and the seriousness of the damage which results, are very different in the upper and lower respiratory tracts. The action of irritant gases and vapors in the nose and pharynx may render them raw by the inflammation without immediate danger or permanent damage.

It is a more serious matter when the trachea and bronchi are injured. Not only are the local

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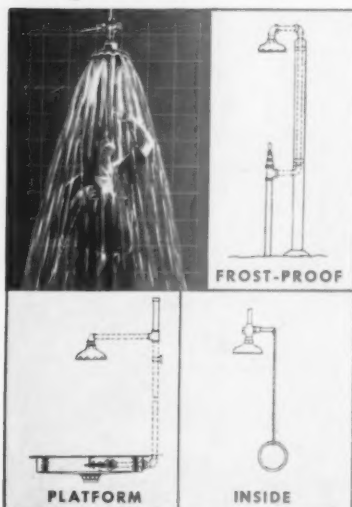
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effects painful, but general systemic effects develop as in acute trachitis and bronchitis from bacterial infection.

The most serious, but least painful, results of inhalation of an irritant gas or vapor occur when the lungs themselves are acted upon. The damage gives rise to an acute edema leading to suffocation or, if this danger is escaped, to pneumonia with prostration and circulatory impairment. The outcome of either process may be fatal.

It can be summarized, therefore, by saying that the locus of action of various gaseous irritants is the result of the differences in their physical properties—particularly solubility, boiling point and volatility; and not so much the differences in their chemical properties.

The harmful effect of an irritant is not in a straight line relationship with the product of duration of exposure and concentration as it is in the case of an asphyxiant like carbon monoxide. A single exposure to a high concentration of an irritant can have an intense effect and can terminate fatally.

However, an acutely fatal exposure to an irritant could probably be tolerated by the system if the concentration were halved and it was inspired over a period of twice as long. This fact leads to the conclusion that any reduction in the concentration of an irritant during its passage through the upper respiratory tract results in a more than proportionate sparing of the tissues of the lung.

Gaseous irritants are generally grouped according to their locus of action. With the exception of the fourth group listed below, these irritants are therefore grouped according to their relative solubilities, which is the physical property that dictates the site of absorption within the respiratory tract. This system of grouping is that presented by Henderson and Haggard in their fine text entitled *Noxious Gases* (2nd Edition, American Chemical Society Monograph No. 35, Reinhold Publishing Corp., New York, 1943).

Group I. *Very soluble—affect-*

ing the upper respiratory tract mainly.

1. Ammonia
2. Hydrochloric acid (HCl)
3. Sulfuric acid
4. Hydrofluoric acid (HF)
5. Formaldehyde
6. Acetic acid
7. Acetic anhydride
8. Sulfur monochloride
9. Thionyl chloride
10. Sulfuryl chloride

Group II. *Intermediately soluble—affecting the upper respiratory tract and deeper structures, such as the bronchi.*

1. Sulfur dioxide
2. Chlorine
3. Bromine
4. Iodine
5. Arsenic trichloride
6. Phosphorus trichloride
7. Phosphorus pentachloride

Group III. *Slightly soluble—affecting the lungs and to a much less extent, the upper respiratory tract.*

1. Ozone
2. Nitrogen dioxide
3. Phosgene

Group IV. The fourth group represents the major exception to the rule of solubility. No general rule as to the locus of action applies in this case.

1. Acrolein
2. Dimethyl sulfate
3. Dichloroethyl sulfide (mustard gas)
4. Chloropicrin
5. Ethylchlorosulfonate
6. Dichloromethyl ether
7. Benzil iodide
8. Methyl chlorosulfonate
9. Chloroacetone
10. Xylyl bromide

This group, as in all the preceding groups, is by no means complete. There are literally thousands of such compounds. The biggest single class of Group IV compounds are the halogenated organics.

In this group, no simple solubility relationship exists. For example, acrolein (acrylic aldehyde) is only very slightly soluble in water, yet it is very irritating to the eyes and the upper respiratory tract. Continued exposure to this compound may lead to lung damage manifested by edema and possible death.

Dimethyl sulfate is a powerful irritant to the eyes and upper respiratory tract, yet is only slightly soluble in water. The action of this material is apparently not due to the decomposition of dimethyl sulfate to sulfuric acid.

Because of the anomalous properties of Group IV compounds, great care must be exercised in handling them. The best clue as to the possible seriousness of exposure to such materials would come from the volatility of the specific compound at the proposed operating temperature. A highly viscous material handled at room temperature would afford little hazard since the concentration of the material in the atmosphere at breathing level would be very low.

Thousands of these compounds have been tested for toxicity and data are frequently available in the literature or from the suppliers. It would be wise for any safety engineer to obtain such information before allowing workers to handle unfamiliar substances.

Before a new compound is manufactured or purchased as an intermediate at Monsanto safe handling information is obtained. This may require a literature search, queries to the manufacturer, or even animal toxicity work. After such information is available, instructions are given to the workers in the area where the material is to be used.

If the compound is such that dangerous concentrations are possible in the working atmosphere, exhaust ventilation is recommended as well as the necessary emergency protective equipment. Safety showers, eye baths, and other permanently installed safety devices are recommended and installed.

The most important step in the process of manufacturing a possibly hazardous compound is in the instructions to the workers. These instructions must include recognition of the compound by smell, recognition of symptoms of exposure, escape routes from the operating area, location and instruction in proper use of all emergency protective equipment, proper fire-fighting techniques,

and proper first-aid and evacuation procedures.

If the above procedures are followed in starting up manufacturing units, toxic exposure to irritant gases and vapors would only arise from accidents such as spills, explosions, etc. We do have exposure from carelessness, but we keep this to a minimum by constant reminders in safety programs and the like.

First-aid procedures in cases where toxic irritants are handled depend largely on the individual compound. However, some generalizations can be made. Evacuation techniques, for example, must be instilled in workers so that when an accident occurs they automatically follow a set procedure in evacuating unconscious fellow workers. If training is lax in this function, all too often the evacuator becomes a victim.

Training in artificial respiration is mandatory where toxic materials are handled. Administering oxygen under exhalation pressure should be taught first-aid attendants or nurses in the plant first-aid station, and the most rapid method of contacting the plant physician should be known by all these personnel.

When an unconscious worker is moved to the aid station, someone should be available to explain to the physician the details of the accident. The physician will want to know what the man was exposed to, for how long, and what first aid measures have already been taken. These are extremely important procedures in cases of exposure to the Group III irritant gases and, in many cases, may save a life. In almost every case of toxic exposure sufficient to cause unconsciousness, time is critically important.

Control must include proper protective equipment, first-aid training, and properly designed ventilation equipment with periodic exposure surveys particularly where one of the insidious irritants, such as the Group II or Group III gaseous irritants mentioned previously, are concerned. Careful study of the process must be made to properly evaluate the problem and to design control equipment. (Turn page)



SAVES MONEY. Use of this mobile ladder truck in the maintenance zone from 7 to 14 feet saves up to 50% over former methods.

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In addition to control of process exposures, provisions must be made to protect workers during unusual conditions such as spills, explosions, etc. This requires thorough safety training in the use of gas masks and other protective equipment. Last, but by no means least, workers must be trained in proper first-aid practice and evacuation techniques.

Happiness? That's nothing more than good health and a poor memory.—Albert Schweitzer.

Use Refrigerant Gas To Blow Warning Horn

A LIQUEFIED GAS, developed a quarter-century ago as a refrigerant, has found a new safety application as the power source for operating emergency warning horns on land and sea.

The "Freon" fluorinated hydrocarbon compound packs a lot of wallop into a small space and makes the warning devices independent of electrical or mechanical power that might fail in

an emergency. In a fire alarm, the liquefied gas is confined under pressure in a small container with a fusible plug or release valve that allows it to expand from a liquid to a gas when warning is needed. Then the expanding gas is routed through a whistle.

Newest of the safety devices is a trigger-operated fog horn approved under U.S. Coast Guard regulations for use on small boats. The horn weighs just under four pounds and will emit a continuous 12-minute blast audible for at least a mile. The devices, larger sizes of which also are available, can be refilled.

A slightly smaller signal horn, listed by the Federal Civil Defense Administration as an approved item for federal matching funds when used in public schools and buildings, contains enough of the liquefied gas to provide 420 two-second blasts. It also is recommended for use in chemical plants, refineries, explosive manufacturing plants and other areas where electrical devices might create hazards.

Another smaller, trigger-operated horn has been designed for use by guards, watchmen, police, firemen, payroll messengers, and nurses who need a signaling device that is instantly available to reach remote areas. Equipped with a belt hook for carrying, it's big enough to provide 84 two-second blasts.

Other variations of the warning devices have been available for some time as fire detector warning horns. They are equipped with fusible plugs that melt when temperatures get above a predetermined safety limit and start the horn operating. Models available with plugs that melt at 136 F. and 174 F. carry the Underwriters' Laboratories seal of approval.

Such fire warning devices, the manufacturer points out, are particularly useful in homes and in industrial and commercial areas not covered by a continuous or frequent fire patrol. The extra minutes of warning they provide often are sufficient to permit quelling the fire before it gets out of hand.

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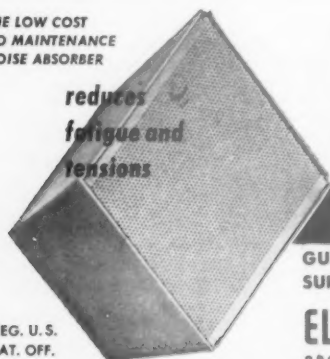
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Around the Compass

—From page 10

of accident prevention measures for small business is spreading throughout the country today, as evidenced by the many new groups that recently have been in touch with the National Safety Council's Small Business Division.

They include the Associated Industries of Georgia, now planning a series of 10 regional safety rallies for small business concerns throughout the state; the Elkhart Chamber of Commerce Safety Council, sponsoring a one-day safety conference aimed at small companies; the Green Bay (Wis.) Vocational Schools, conducting short safety training courses for supervisors in small firms; and the annual Greater New York Safety Conference which is planning a special Small Plants session with Manager Harry Brainerd of the Western Pennsylvania Safety Council as one of the featured speakers.

Many associations and other groups are stepping up their programs to meet the small business safety challenge and when proper recognition is given to this important field for planned accident prevention, results will be reflected favorably in national occupational accident statistics.

Sh! Europe Leads In Noise Control!

Some European builders are far ahead of the Americans in eliminating noise from their structures, delegates to the Second Annual West Coast Noise Symposium were told at the two-day meeting held at the University of California-Los Angeles, in early December.

More than 200 delegates heard Dean Vern O. Knudsen of the University Graduate School say that modern apartment houses in England, Holland, and the Scandinavian countries are acoustically designed for freedom from noise and that building codes in these countries require real sound-proof construction.

The symposium, coordinated by the Greater Los Angeles Chapter,

NSC, placed emphasis on a study of community noise. W. H. Blucher, consultant to the American Society of Planning Officials, said planners can help reduce noise by adopting more modern zoning practices for industry. The present practice of locating industry on the basis of "light" or "heavy" industrial use, he said, is outmoded. He advocated the selection of sites on the performance

standards of the industry involved.

Speaking on aircraft noises, C. G. Smith, assistant administrative officer, Los Angeles Department of Airports, warned that the multi-jet transports of the future would probably be many times noisier than present-day propeller-driven aircraft. He recommended planting strips around airports and industrial buffer

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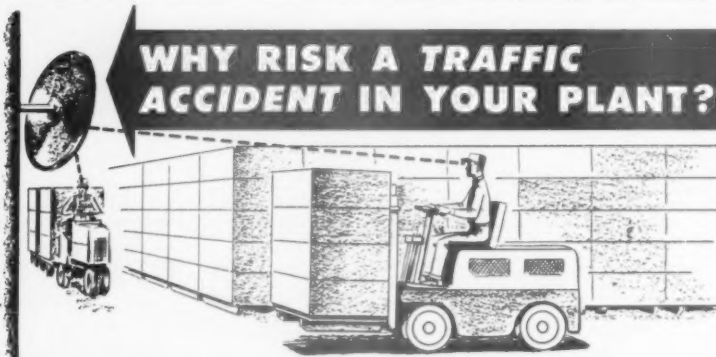
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zones between airports and residential districts, to combat the noise problem.

N. Borytinski, of a Los Angeles architectural firm, urged architects to use the services of acoustical engineers in planning industrial construction. "Sound men," he said, "should be an integral part of the building team."

A Leaflet That Sells Safety

An excellent leaflet distributed by the Greater Atlanta Traffic and Safety Council recently has reached NSC headquarters. Designed as a preliminary approach to industrial and mercantile leaders in the area, it contains pictures and statements from five of the city's foremost citizens regarding the work of the Atlanta organization, its importance, and the need for public support for "a necessary agency for accomplishing this job."

The men quoted are Richard H. Rich, president, Rich's, Inc.; H. L. Ebersole, vice-president, Davison-Paxon Company; Robert R. Snodgrass, president, Atlas Auto Finance Company and vice-president of the National Safety Council; Fred B. Moore, president of the Atlanta Traffic and Safety Council, and L. F. Montgomery, chairman, Atlanta Coca-Cola Bottling Company. It is a straight-from-the-shoulder appeal from Atlanta's top leadership—and each statement is concise and convincing. The fold-over leaflet is titled "Atlanta's Number 1 Problem."

"Salute to President Eisenhower"

Safety minded San Franciscans went all out in their S-D Day advance promotion, climaxing 10 days of intensive educational effort with a "television" salute to President Eisenhower for his interest and leadership in highway safety.

The 90-minute network show over KGO-TV covered Northern California from 10:30 to 12 midnight on November 30. The salute was sponsored by Joint Councils #7 and #38 of the International Brotherhood of Teamsters in cooperation with the National Safe-

ty Council and its Northern California chapters.

Featured was the drawing of prizes for the Teamster-Green Cross pledge card drive held in August and September. Sparkling entertainment was interspersed with convincing appeals for driver alertness. The long list of entertainment talent included Sammy Davis, Jr. and Beverly Hudson, Hollywood vocalist. Each had been badly injured in a serious automobile accident so each one took occasion to tell of their personal acquaintance with highway tragedy. A special message was broadcast from Los Angeles by Governor Goodwin J. Knight.

"What's in It for Me?"

"Plenty!" said Charles E. Doerler, executive secretary of the Louisiana Safety Association, as he studied the front page of NSC's recent brochure on general safety, titled "What's in it for Me?" Whereupon he sat down and ordered several thousand copies. Why? He figured—correctly—that if this colorful booklet could be sent out with his own program for the Louisiana state-wide Safety Conference, it would add sales punch in building general interest in his sessions. So, he had his printer stitch a copy inside the front cover of each of his printed programs, and cut out just enough of his first page to show in big,



Ned H. Dearborn (right), president of the National Safety Council, thanks Lawrence Welk, noted orchestra leader, whose TV show is sponsored by the Dodge Motor Division of the Chrysler Corporation, for wide publicity given safe driving hints on the "Dodge for Life" TV quiz program. Safety messages prepared by the National Safety Council were written into the script of the quiz on the highly-rated Lawrence Welk Show by the Grant Advertising Agency.

bold letters the NSC title "What's in it for Me?" It proved a novel way of making good use of NSC material at low quantity cost by combining it with local programs.

"Is It Luck or Science?"

A mailing piece for regular and prospective members of the Lansing Safety Council, "Is It Luck or Science?", places emphasis on the statement that Lansing is "280 per cent safer" today than it was in 1940 and sets forth some substantiating facts and figures. The six-page fold-over outlines concisely the functions of the six divisions of the council—Industry, Commercial, Vehicle, Women's Activities, Traffic, Schools—and the latest addition to its broad program of activities, the Insurance Agents' division. A pertinent sentence from the well-written pamphlet reads: "In safety the only measure of success is life itself," and goes on to point out that in the past 10 years there has been a saving of 32 lives in Lansing.

N. Y. Training Course

The average attendance at the Thirteenth Industrial Supervisor's Safety Training Course conducted in late fall by the Greater New York Safety Council was 820, a larger attendance than the previous year. Subjects for the three weekly sessions were "Working Smarter, Not Harder, with Safety," "Don't Forget the Fundamentals," and "Straws in the Wind."

31st Course in Syracuse

The 31st annual Industrial Safety Series of the Safety Division, Syracuse Chamber of Commerce, started January 12 with Kenneth G. Bartlett, vice-president of Syracuse University, as the opening session speaker. On February 9, Donald E. Mumford, safety engineer for the New York Central System, will talk, and on March 8 Miss Marion Martin, Maine Commissioner of Industrial Safety and vice-president of NSC, will address the group on the subject "The Fourth E of Safety." The final session, April 12, will be in charge of the Syracuse Radio and Television Center with the general subject "They Did Not Die!" More than 2,000 are expected to attend the series.

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FLASH FIRE and
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ECONOMICAL TOO!

TESTS PROVE OIL SPUNJ
PROVIDES UP TO
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COVERAGE and
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LUBRICATING OIL,
CHEMICALS,
OTHER LIQUIDS



It's your best, most economical buy in oil and grease absorbents to increase plant efficiency and safety.

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CANFIELD OIL COMPANY

General Offices: Cleveland 27, Ohio
Branches: London, N. Y., Chicago, Ill., New York, N. Y., Memphis, Tenn.

Accident Post-Mortems

—From page 32

plant doctor. The operator was told to report to the hospital for X-rays on the following morning. The X-rays revealed a fracture of the 12th thoracic vertebra. The operator lost 58 days before he returned to work and was given light duty.

All clamp tractors used for handling rolls of material are nor-

mally equipped with overhead guards. In transporting tractors from one area to another the guards are removed to allow the tractor to be placed on a truck. In this particular case, the tractor guard was not available so that the tractor was put in service without the guard.

Because of limited storage space the rolls were being stacked nine high by equipment that was not designed for such stacking.

Comment: One of the first things you might say is that the supervisor should not have let the tractor go into operation without an overhead guard. Perhaps there are a few other facts which also contributed to the cause of this accident. The clamps were designed to handle only two rolls at a time whereas the operator was handling six rolls. Of course, we cannot absolve the supervisor, or the operator from overloading the vehicle and operating it without proper safeguards. Perhaps we can, to some extent, absolve the operator for trying to do his job and following instructions.

Action taken to prevent recurrence should include:

1. Rolls of material should not extend beyond the top of the clamp when stacking or transporting them.
2. All tractors should be equipped with an overhead guard when stacking materials above the head of the operator.
3. Cross tying of rolls of materials, when stacking, should be practiced to make a more secure pile.

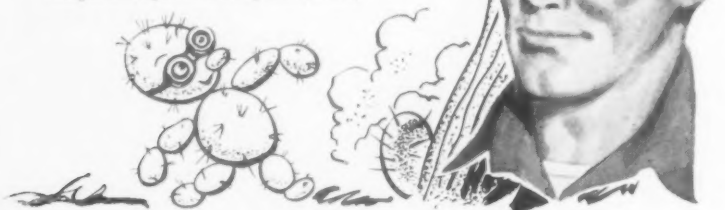
Eyes DUSTY, DRY?

YOU NEED ... FOG-PROOF, GAS-TIGHT GOGGLES

...for paint spray, gases, dusts, fumes, smoke. They hug your face so securely that hazardous outside elements cannot reach your eyes. Fog is removed from lenses by an easy nod or shake of the head. The few drops of water placed on the inner wall of the lens do the trick. Can be worn with any respirator. Sample, \$2.00 postpaid.

H. S. COVER, P. O. Box 2508, South Bend 14, Ind.

"Respirators for Industry since 1894"



Squeeze Play

An employee was taking a loaded four-wheeled hand truck from the plant out onto the dock and then onto a truck. Instead of pushing the four-wheeled truck, the employee was pulling it. The truck was parked on an incline so that its front was lower than the dock. As the employee pulled the load onto the truck it started down the incline and got away from him. It rolled forward, pushing the employee ahead of it and pinning his legs between the truck body and the hand truck.

Comment: This employee either did not know how to handle the truck, or he was never told how to handle the hand truck. As we all know, hand trucks should always be pushed, not pulled, unless the truck is equipped with a "fifth wheel" and handle. Safe practices should be reviewed with the men to be sure they understand the reason for the specific work practices.

Perhaps the loading dock needed some engineering work. If the bed of the truck sloped away from the dock, the hand

DOUBLE DUTY SAFETY BULLETINS THAT HELP CHECK ACCIDENTS

SAFETY PERFORMANCE

Number of days since last time accident

Number of days in last 30 days

Number of days in last 90 days

Number of days in last 180 days

Number of days in last 360 days

SAFETY BULLETIN

THIS DEPARTMENT HAS WORKED FOR THE LAST 30 DAYS

BEST PREVIOUS RECORD WAS 3751

DO YOUR PART TO HELP MAKE A NEW RECORD

PIPE LINE DEPARTMENT

ACCIDENTS ARE AVOIDABLE

BE CAREFUL IN EVERYTHING YOU DO

LAST TIME ACCIDENT 10-1-56

LAST TIME ACCIDENT 10-1-56

NOTICE

EMPLOYEES CHECKING IN

EMPLOYEES CHECKING OUT

EMPLOYEES CHECKING IN

EMPLOYEES CHECKING OUT

CAUTION

BE CAREFUL

BE CAREFUL

BE CAREFUL

BE CAREFUL

DANGER

BE CAREFUL

BE CAREFUL

BE CAREFUL

BE CAREFUL

NOTICE

This dept. will be closed Jan. 3 & 4 for inventory

WATCH OUT

for falling objects near construction work

WRITE FOR NEW SAFETY SIGN CATALOG

Prairie State Products Co.

2822 LAWRENCE AVE. CHICAGO 25, ILL.

truck could have gotten away from the man in any event and might have done some damage to the truck, or the material on the hand truck. In any event, the truck bed should be at the same height as the dock and as nearly level as possible.

Starts Tractor Involuntarily

A laborer was sitting temporarily on the back of a parked tractor with his arm resting on the two control levers. The weight of his arm moved the reverse lever into operating position and started the tractor backward. This happened so quickly that he was pinned between the body of the tractor and a nearby guard rail before he was able to stop it. The result: a fracture of his left pubic bone.

Comment: Evidently this tractor was parked with either the motor running, or the power switch (if it were battery-operated) left on. Rules for tractor operators state that switches should be turned off and the keys removed when the vehicles are parked. Also, only authorized operators are allowed on the factory trucks.

Two individuals in this case evidently were not aware of the rules or didn't understand the reason for established safe work practices.

What corrective measures would you suggest?

Announce Awards for Employee Publications

ENTRIES ARE NOW being received for awards for outstanding merit in the promotion of safety in employee publications. The contest is being sponsored jointly by the National Safety Council and the International Council of Industrial Editors.

Entries will be grouped in four classes:

1. Magazines—offset and letterpress.
 2. Newspapers.
 3. Mimeographed, employee safety bulletins, miscellaneous.
 4. Publications for engineering, supervisory, and other specialized groups.
- Five certificates, without rank,

are offered in each group. If, in the opinion of the judges, there are more deserving entries in any group, they may increase the number of awards. Likewise, if any section should have less than five deserving entries, they may reduce the number of awards accordingly.

There is no entry fee and it is not necessary for any contestant to be a member of the National Safety Council or any editorial association.

Two of the judges will be ap-

pointed by the ICIE and one will represent the National Safety Council.

Three sets of each publication—that is, three copies of each of three issues carrying a 1954 date-line—nine all told, must be submitted. Address the package:

Employee Publication Awards
National Safety Council
425 North Michigan Ave.
Chicago 11, Illinois

Entries must be postmarked not later than midnight, March 1, 1956.



Mecco SAFETY Steel Letter and Figure Stamps

... are now supplied in indestructible plastic boxes with transparent lid for quick identification of stamps. Made of special alloy steel to prevent dangerous mushrooming, spalling, and providing 50% to 100% longer marking service—sets of these stamps are available in character sizes from 1/2" to 1" for all marking applications. Stamps 1/4" and smaller are furnished in the new, attractive, serviceable package.

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Write for Bulletin LF-108

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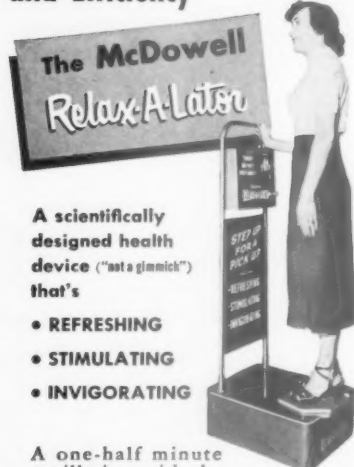
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A scientifically designed health device ("not a gimmick") that's

- REFRESHING
- STIMULATING
- INVIGORATING

A one-half minute oscillation with the McDowell Relax-A-Lator provides an invigorating pickup for everyone—particularly those suffering from fatigue or tired feet and legs. The result: increased efficiency, more production, fewer accidents.

Write for details

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"VEKI" SAFETY CAP



DESIGNED FOR GREATEST INDUSTRIAL SAFETY

VEKI's larger, roomier elastic-type snood is designed specifically for enclosing more hair than any conventional type cap . . . full protection for all hair all the time! Front of twill. Back is made of mesh—can also be had in solid or flame-proof materials. Navy blue, and brown. Adjusts to all head sizes. Descriptive literature on request.

Manufacturers and distributors of a complete line of safety clothing and equipment.
Write Dept. NS-2 for information regarding your needs.

**V. E. KENNEDY-
INGALLS CO.**

3735 NORTH 35TH STREET
MILWAUKEE 16, WISCONSIN

Industrial Health

—From page 46

very flimsy. This makes it possible for the front seat to add its weight to the weight of the driver or passenger when they are thrown forward into the windshield or dash.

Poor seat design also accounts for the many "whiplash" injuries which are seen in motor vehicle crashes. These usually result when the car is struck from the rear and suddenly accelerated. The sudden acceleration of the seat whips the head back over the seat which is not sufficiently high to afford support, and tearing of ligaments, muscles and muscle attachments results. Fractures of the neck are not infrequent. These are the most disabling of all non-fatal automobile injuries and could be prevented almost completely by raising the back of the seat sufficiently to support the head in case of such an impact.

Most cars have projections about the inside of the body which can produce severe injuries to anyone thrown against them in a crash and which could readily be removed.

Steering wheel injuries have been extremely common in the past but the automobile industry has recently given this much thought and apparently is rapidly overcoming the situation.

Use of seat belts is highly advocated but they still require a great deal of improvement in design in order to be convenient and more or less automatic in use so that they will be used on short jaunts about the city as well as on long drives.

It is recognized that the automobile industry has added a great deal to the safety of the automobile through improved frame construction, power brakes, power steering and similar mechanical improvements but none of these add to the driver's or the passenger's chances of survival during an actual crash. It is recognized that no single company can take the risk of doing a complete safety revision of its car design since it might be disastrous financially if it did not immediately catch on with the general public.

This could be done by cooperation within the industry but it seems unlikely. It is proposed, therefore, that a national group be set up to regulate and approve automobile safety in the same way that safety requirements in rail transport, air transport, and even highway transport and buses are controlled by national regulatory agencies. This group would allow the industry to pool safety ideas and would eliminate financial risk because the same measures would be required of all manufacturers.

It is expected that there will be resistance to the suggestion of such a national regulation but protection of the public through legislative control of safety measures is an accepted part of daily life and is not different in essence between the regulation of automobile design for safety and inspection of foods or drugs. Even now automobiles must have adequate lights and brakes and can be operated only by drivers who have passed a state drivers' license examination. In view of the fact that automobile injuries have taken the lives of 38,000 persons per year some concentrated effort and even heroic measures seem to be indicated.

Safety Data Sheet on Hydrogen Peroxide

PUBLICATION of a new, revised safety data sheet on hydrogen peroxide (SD-53) has been announced by the Manufacturing Chemists' Association.

The 20-page booklet, part of a continuing series of safety data sheets, gives properties and essential information for the safe handling and use of hydrogen peroxide, including material on shipping containers, storage, waste disposal and health hazards and their control.

Copies of Chemical Safety Data Sheet SD-53, "Hydrogen Peroxide," may be obtained from the Manufacturing Chemists' Association, 1625 Eye St., N.W., Washington 6, D. C., at 30 cents each.

A minor operation is one performed on someone else.

President's Other Hat

—From page 29

they learn more about accident prevention even from the smallest mishap.

Inspection is a routine at General Engineering. Foremen inspect the machines in their departments and report worn parts or needed repairs to the Tool Maintenance Departments.

"We have the best repair department you're likely to find in any shop," boasts Albert Fioretti, oldest employee in length of service and foreman of the Automatic Department. "When something needs repairs we get cooperation and prompt action."

Every Monday morning the maintenance man inspects the locks on the covers of the three centrifugal separators which are used to salvage oil from scrap. It was a defective lock on such a machine that caused Mr. Knuepfer to become vitally interested in safety almost 30 years ago.

The lock on the cover of a centrifugal separator suddenly gave way and the cover flew off. About 20 windows were broken, but no one was injured. The incident could have killed several men working nearby, however, and it gave the management something to think about.

Training is not a major problem in a plant with the small turnover of the General Engineering Works. One typical department has seven men with an average length of service of 16 years.

When Foreman Fioretti is assigned a new man—and this is seldom—he instructs him on his machine, pointing out the safety features and the hazards. Then he watches him closely the first day.

"I watch how he goes about his work. The machine is safe before he goes on; I try to find out if he is. I notice his attitude, whether he is careless, check his housekeeping. I can tell in one day whether he's a safe worker. If he isn't, I report him at the end of the first day."

Unsafe Practices. Discipline is rarely needed, but occasionally a worker will be observed violating

a safety rule. If the man's foreman isn't on hand, the president of the company breaks his rule of dealing through foremen and speaks to the man himself.

During one of his daily tours through the machine shop, Mr. Knuepfer saw a man using a punch press equipped with a two-hand trip with one trip lever tied down. The man was told he'd be fired on the spot if it ever happened again. That was the end of that trouble.

Some machine operators work on a production bonus basis which could be conducive to accidents, but hasn't caused one yet. Foremen and management watch closely for short cuts and carelessness caused by haste.

Housekeeping. Probably the biggest housekeeping problem is caused by oil. Oil vapor from the screw machines condenses on machines, light fixtures, almost anything made of metal. Continual wiping is the only answer.

Aisles are always kept clear. Metal stock is neatly stored.

"Oil spots on the floor don't stay long," says Foreman Bingham. "Everyone does his share to clean them up without being told."

The president's daily walks through the shop are an important housekeeping help, too. Generally he doesn't mention minor violations the first time. But if they are uncorrected on the next trip the person responsible hears about it—quickly and loudly.



"Have you noticed, dear, I moved the hat-rack?"

On-The-Spot FIRST AID

... when it counts

PAC-KIT®



Instantly avails supplies and accessories for emergency care of burns, cuts, bruises, lacerations, superficial eye injuries, uncontrolled bleeding, fainting, fractures and allied injuries common to industry. PAC-KITS are indispensable where shops lack medical facilities.

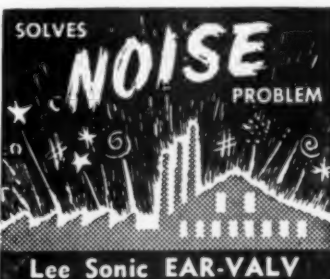
Average fellow worker can instantly apply any of the various replaceable items contained in the heavy-duty dustproof, moistureproof cabinet.

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MECHANICAL hearing protector
NOT AN EAR PLUG



Inner valve actuated by sound pressure automatically controls sound entering ear; removes harm from noise without interfering with conversation or normal air circulation.

INSURES AGAINST HEARING LOSS
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- A SUPERIOR SAFETY DEVICE
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GRANET gloves are made for every job, in a complete range of styles. They outwear ordinary gloves yet cost no more. Test GRANET gloves in your plant now, without cost or obligation. State type of use, so that we can provide correct glove.

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Translating information into chart form is the best way to sell your story quickly and dramatically and NOW—with Chart-Pak—everything you need is printed on rolls of tape! You roll on dotted lines, bars, figures, dates. You can't make a costly error—it can be taken up as quickly as it is put down. The average charting time is minutes—the cost—far less than other methods. And you or your secretary can do it.



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Calendar Contest Winners For December 1955



"I'm strong as an ox," said big Joe,
"This safe's not so heavy, you know."
But Joe soon found out,
That beyond any doubt

First prize of \$100 in the National Safety Council's Safety Calendar Contest goes this month to Mrs. Harold Landes of Mishawaka, Ind. The theme in this contest was "Get Help When Needed." Mrs. Landes' line was adjudged the best of all those submitted. It was:

Even oxen "team up" when they tow.

Second prize of \$50 went to Mrs. Ned Fish of Columbia, Mo., for this line:

Such a "moving" performance costs dough!

Third prize of \$25 was awarded to Jess Massingale of Great States Corporation, Shelbyville, Ind. for the following line:

When jobs DO require TWO, best say so!

Thirty \$5 awards were issued to: Warrick E. Lee, mgr., Bell Telephone Co., Carbondale, Pa.

Eleanor K. Walsh, East Hartford, Conn.

Mrs. A. R. Poole, Corvallis, Ore.

Mrs. Arnold Adams, Milton, Mass.

Mrs. Celia Arthur, Ilion, N. Y., Sperry Rand Corp.

Mrs. Lois McCarthy, Pocatello, Idaho, Kraft Foods Company.

Mrs. W. Zimmerman, Pine Grove, Pa.

Harold J. Schaefer, Hercules Powder Co., Parlin, N. J.

Mrs. Stephen J. Pettovar, U. S. Atomic Energy Comm., Washington, D. C.

Minnie Maze, Monongah, W. Va.

Emil Karchnak, assistant electrical foreman, Bethlehem Steel Co., Johnstown, Pa.

Thomas Kahn, Chisholm, Minn.

Mrs. Roy Hopkins, Ironwood, Mich.

John Kutsik, Jr., crane operator, Bethlehem Steel Co., Bethlehem, Pa.

Mrs. Calvin Brown, Noblesville, Ind.

Elmer McElhone, janitor, Northwestern Public Service Co., Aberdeen, S. D.

Mrs. Raymond Diekman, Ferguson, Mo.

Mrs. George A. Gannon, St. Louis, Mo.

Mrs. Dorothy La Traille, Phoenix, Ariz.

Mrs. Roy E. Goodnight, Morenci, Ariz.

Jesse H. Long, TVA-Construction Dept., Chattanooga, Tenn.

Mrs. W. N. Sanders, Bessemer, Ala.

Mrst Ann Lacy, Mississippi Chemical Corp., Yazoo City, Miss.

F. A. Landers, fleet supvr., Baroid Div., National Lead Co., Houston, Tex.

John G. Greene, machine operator, Caterpillar Tractor Co., Peoria, Ill.

Mrs. Jack Stonehouse Wolverine, Mich.

C. K. Scoles, fireman, Southern Colorado Power Co., Pueblo, Colo.

Alex Balas, tirebuilder, Firestone Tire & Rubber Co., Akron, Ohio.

Earl Sayer, quarry worker, New Haven Trap Rock, Wallingford, Conn.

Walter E. Wolff, Alpha Portland Cements Co., Martins Creek, Pa.

Industry and Government should combine in the campaign against

DRUNKEN DRIVING

by adding to your present procedure a simple accident must for determining intoxication.



The Harger Drunkometer, used nationally in industry, is the oldest and most widely used of the breath methods.

Write today for information and list of successful users. N-202.

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RED BANK NEW JERSEY



It's actually easy to save money — when you buy Series E Savings Bonds through the automatic Payroll Savings Plan where you work! You just sign an application at your pay office; after that your saving is done for you. The Bonds you receive will pay you interest at the rate of 3½% per year, compounded semiannually, when held to maturity. And after maturity they go on earning 10 years more. Join the Plan today. Or invest in Savings Bonds regularly where you bank.

Safe as America — U. S. Savings Bonds

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His calling card had claws on it



LUTHER KELLY lied about his age and got into the army at 15. They sent him West in 1865, and he stayed.

He liked the wilderness. Game abounded. In Trappers' Lake, "trout were so thick they obscured the bottom."

Hostile Indians were also pretty thick. But when two tried ambushing him, he killed both with his Henry .44.

He learned Sioux and sign language.

One day, he visited General Miles, sending a huge fierce-clawed bear's paw to Miles as his calling card. Miles made him chief scout against the Sioux.

But by 1885, the country was taming down, and Yellowstone Kelly left it.

Two decades later, Teddy Roosevelt praised the heroic treasurer of Surigao in the Philippines who saved the town from outlaws. Name: Luther S. Kelly.

Yellowstone Kelly's body now rests at Kelly Mountain in Montana. But his restless, pioneering spirit lives on in the heart of today's America. For it is the trail-blazing courage of 165 million people that makes America great, and that provides the real strength behind one of the world's finest investments: our country's Savings Bonds.

Why not guard your security with this strength? Invest in U.S. Series E Savings Bonds. And hold on to them!



"JOB-FITTED COMBINATION SCRUBBER-VAC

PUTS FLOOR-CLEANING ON PRODUCTION BASIS

throughout our plant"

...in the
Tool Room



... Punch
Press Room



...Cafeteria
and other
areas



— Says Superintendent of Maintenance
VICTOR ADDING MACHINE COMPANY, CHICAGO

Victor Adding Machine Company insists on maximum production in floor-cleaning as well as in manufacturing. Like other production-wise industrial concerns, Victor cleans floors with a Job-Fitted Combination Scrubber-Vac! This single unit

Completely Mechanizes Scrubbing

—applies the cleanser, scrubs, flushes if required, and damp-dries the floor—all in one operation! Job-fitted to specific needs, a Scrubber-Vac provides the maximum brush coverage consistent with the area and arrangement of the floors.

Model 213P, shown in illustrations at left, is designed for heavy duty scrubbing of large-area floors. It has a 26-inch brush spread, and cleans up to 8,750 sq. ft. per hour! Finnell makes still larger sizes—in gasoline as well as electric models—and also sizes for smaller operations. From this complete line, you can choose the Scrubber-Vac that will put your floor-cleaning on a production basis and reduce labor costs. And you can lease or purchase the machine. Maintenance men like the convenience of working with a Scrubber-Vac. This all-in-one unit is self-propelled, and has a positive clutch. There are no switches to set for fast or slow—slight pressure of the hand on clutch lever adjusts speed to desired rate. The powerful vac performs quietly.

In keeping with the Finnell policy of rendering an individualized service, Finnell maintains a nation-wide staff of floor specialists and engineers. There's a Finnell man near you to help solve your particular floor-maintenance problems... to train your operators in the proper use of Finnell Job-Fitted Equipment... and to make periodic check-ups. It's also good to know that Finnell makes everything for floor care! For demonstration, consultation, or literature, phone or write nearest Finnell Branch or Finnell System, Inc., 2202 East St., Elkhart, Ind. Branch Offices in all principal cities of the United States and Canada.

FINNELL SYSTEM, INC.

Originators of Power Scrubbing and Polishing Machines



BRANCHES
IN ALL
PRINCIPAL
CITIES

NEW SAFETY EQUIPMENT

Further information on these new products may be obtained by writing direct to the manufacturer or by circling the corresponding item number on the Reader Service Postcard.



Skin Cleaner Dispenser

This waterless skin cleanser is packaged in a five oz. polyethylene tube for individual application. It is designed especially for office workers or individual workmen. The cleanser, SBS-30, is a cream product, and can be dispensed by simply squeezing the tube. The tube is lightweight, will not dent, corrode, break or crack, and can be kept in a worker's tool box. The tube contains an average of 60 waterless hand washes, of the cosmetic grade white cream containing lanolin and other skin conditioning agents. It can be used for removal of grime, grease, tar, paint, varnish, ink, etc. and is also useful in the control of dermatitis.



Sugar Beet Products Co., Saginaw, Mich.
(Item 1)

Industrial Vacuum Cleaner

A quiet, transferable head vacuum cleaner allows easy change from one 55-gallon drum to another. This allows filling of as many drums as



necessary. The head is also transferable to the manufacturer's 15- and 10-gallon size tanks.

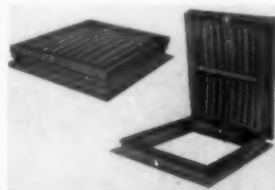
The many applications for this

vacuum head make it a very practical piece of equipment, as it can perform the work of three different size cleaners.

Hild Floor Machine Co., Inc., 740 W. Washington Blvd., Chicago 6. (Item 2)

Fire-Vent Sky Light

A new sky light product called the "Fire-Vent" is said to contain the features of aluminum and fiber glass panel sky lights. The unit is fabricated of tough fiber glass reinforced translucent structural panels set in an extruded aluminum frame. This construction gives automatic and immediate ventilation in case of fire. When fire or excessive heat occur, a fuseable link will separate, causing the cover section of the sky light to open and remain open until



manually closed. The opening mechanism consists of an aluminum enclosed spring unit with stainless steel rod, eliminating exposed springs.

The "Fire-Vent" is equipped with self-contained curb and roof flange and is designed for installation directly to roof opening. It eliminates the need for curb construction and curb flashing.

The Marco Co., 45 Greenwood Ave., East Orange, N. J. (Item 3)

Safety Hat

A new safety hat and cap with a full-floating head band completely adjustable to head sizes from 6½ to 8 inches is called the "Super Guard."

Molded from a flame-retardant, water-proof material in seven different, permanent colors, the hat meets government specifications GGG-H-142B as now in effect.

No lacing is involved in various head adjustments and each size setting is positive and secure. Adjustment difficulties are eliminated. The hat is fitted with a new plastic cradle, giving a high degree of hygiene. No



metal of any kind is used, and only the wrinkle-free sweat band, leather and leatherette, need be replaced when transferring the hat from one employee to another.

The Boyer-Campbell Co., 6540 St. Antoine St., Detroit 2, Mich. (Item 4)

Two-Hand Clutch Control

This electric two-hand clutch control for industrial machines increases both production and operator safety.



The system incorporates what the company describes as "fail-safe," "can't-cheat" and "set-up and run" features.

The "fail-safe" operation is said to make accidental operation of the clutch impossible. The clutch can operate only when the control system is functioning properly. Two sets of contacts close on the actuator load on each operation, and both must be released before the next operation can be performed. A third set of contacts "breaks" the load, eliminating any danger of sticking contacts. If a component fails or is broken in any position, the control system becomes inoperable.

Operators can't cheat on the control by tying down one control switch and attempting to operate with one hand. The system's "can't-cheat" feature requires operation of all switches in the control circuit within a predetermined and adjustable time interval. Both hands must be on the controls. If an attempt is made to cheat, or if the control fails to operate properly, the circuit instantly trips out.

The "set-up-and-run" characteristic protects operators, set-up men and expensive dies from an unexpected power stroke during set-up. The machine's motor must be turned off before the clutch can be actuated. The control also prevents the clutch from being engaged on a dead flywheel and an unexpected stroke occurring when the motor is started.

Micro Switch Div., Minneapolis-Honeywell Regulator Co., Freeport, Ill. (Item 5)

Top Entry Ball Valve

This top entry full round flow ball valve incorporates a change in valve design, simplicity, and ease of installation and operation.

The valve allows fast change of direction of shut-off. The removal of the body cap permits reversing the cage assembly when direction of flow is changed. Changing the direction of shut-off, changing seat



material, and cleaning of the valve can be accomplished without removing the valve from the line. Interchangeable seat material is available in Buna-N, Neoprene, Kel-F, Teflon, and nylon. The new stem design allows the handle to be placed in any of eight positions.

The valve is made of bronze and is designed for handling oxygen and hazardous liquids as well as water, oil, and gas. It carries 300 psi. on

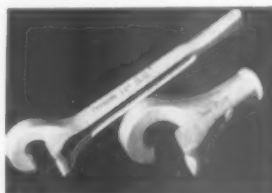
water, oil and gas and 400 psi. on LP gas.

Rockwood Sprinkler Co., 38 Harlow St., Worcester 5, Mass. (Item 6)

Valve Wheel Wrench

In addition to their present 12-, 18-, and 26-in. valve wheel wrenches, this company now markets a new type wrench head, No. 105, socketed for variable lengths of one-inch pipe handles.

Made of bronze and an aluminum-magnesium alloy, the wrenches are spark-proof, and will not slip off or make hand-cutting burrs on valve

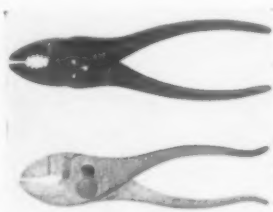


hand wheels. The valves are tested for strength and designed for safety, and center automatically and provide positive fulcrum up to 45° angle.

Bergman Safety Spanner Co., 927 Butler St., Toledo 5, Ohio. (Item 7)

Slip-Joint Pliers

Six- and 8-in. combination slip joint pliers, forged to steel tools specifications and stronger than previous cast models are new spark-resistant safety tools. The new pliers are slimmer than cast products, and section thicknesses are on



a par with alloy steel tools and are nearly equivalent to alloy steel pliers in strength.

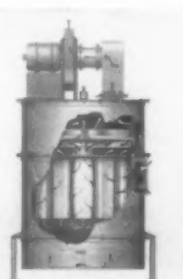
These tools are designed for use in hazardous locations where accidental sparks from a steel tool might result in a fire or explosion. The tools are non-magnetic, corrosion-resistant to most acids and chemicals, and will not chip or mash.

The Beryllium Corp., Reading, Pa. (Item 8)

Dust Filter Unit

This dust filter allows efficient, automatic, continuous, low-cost air filtration. Called "Type RJ", it can handle air volumes up to 1,200 cfm.

No shutdown is necessary for rapping or cleaning. Cleaning and discharge of material is handled automatically and continuously. The high efficiency of the filter is due



to the use of the Hersey principle of high velocity reverse air cleaning. The filter differs from the usual Hersey principle in that the dust is deposited on the outside of the filter sleeves.

Twelve filter sleeves are employed in the unit and the filter media is made of felted material. The reverse air for cleaning the filter sleeve surges from an indexing drum through each sleeve individually. All moving parts in the filter are located on the clean air side of the filter media. The filter can be arranged for portable operation by mounting on casters.

There is a choice of a dust drawer or hopper for intermittent operation or a hopper and rotary valve for continuous discharge.

The Day Co., 810 Third Ave., N. E., Minneapolis 13, Minn. (Item 9)

First Aid for Burns

This new product for first-aid treatment of burns is non-toxic, non-irritating, and contains no harmful drugs, such as acids, alcohol, or benzocaine. It may be used on any part of the body. It is packaged in 3-, 5-, and 11-oz. aerosol containers. Application of the product by means of the aerosol spray is painless and sanitary. The relief of



pain is said to be rapid, and the area is thoroughly and lightly covered.

The product — called F.O.B. — has

both anesthetic and antiseptic qualities, and may be used directly as it comes from the container, or on wet dressings.

E. D. Bullard Co., 275 Eighth St., San Francisco 3. (Item 10)

Work Glove

This work glove is called the "Rubbergran." It is offered in a wide variety of lengths of gauntlets, and is available for both men and women in the fully coated and palm coated styles.



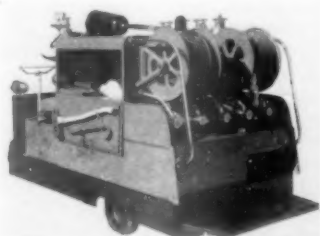
It is a specially designed glove constructed of natural rubber with a roughened anti-slip surface. The "Rubbergran" is said to contain construction features that are unique among rubber-coated gloves.

The Granet Corp., 19 Loring Drive, Framingham, Mass. (Item 11)

In-Plant Fire Truck

A new "in-plant" fire truck has four major fire fighting guns. Designated Model S-556, the truck carries carbon dioxide, dry chemical, water and foam.

The truck makes readily available large volumes of extinguishing



agents in any part of an industrial plant. The truck has a speed of 15 miles per hour, and a turning radius of 96 in.

A 15-ft. accessory cabinet is included as well as a ladder cabinet for an extension ladder. Hundred-foot hoses for water, fog and carbon dioxide are standard equipment.

Other trucks can be equipped to protect any type of plant, including chemical, metal working, textile, plastic, woodworking and many others.

Seco Engineering & Manufacturing Co., 1300 West Fort St., Detroit 26, Mich. (Item 12)

Rotary Pressure Joint

This new rotary joint is a 1½-in. pipe size, single-flow type PR 25, designed to convey liquids or gases



from a stationary pipe outlet to a revolving cylinder, drum, calender, dry can, etc. The joint is heavily constructed and is equipped with two ball bearings to support and guide axially, the revolving shaft, thus preventing misalignment and wobbling of the shaft. This feature assures continuous leak-proof performance.

Seamlex Co., Inc., 41-23 24th St., Long Island City 1, N. Y. (Item 13)

Eye Glass Cleaner

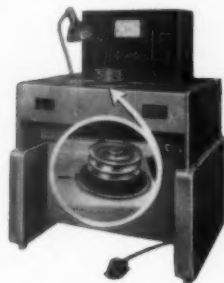
This silicone product, called "Lens-Wick," is a clear odorless compound for cleaning eye glasses.

This product is said to stop streaking on the glasses and not only cleans and polishes, but reduces fogging as well as soiling and scratching. It will not evaporate and is guaranteed to last for a year. The manufacturer says that "Lens-Wick" will act as a water repellent preventing a water film from forming on the surface. It is especially adaptable to such operations as welding, because the product is stable in both high and low temperatures.

Federal Research Industry, 2860 Wyandotte St., Baton Rouge, La. (Item 14)

Balancing Equipment

Two vertical static balancing machines have been added to this company's line of static and dynamic balancers.



Model 201-VL has a weight capacity of 1 to 20 lbs., and will handle diameters up to 20 in. Model 201-

VH will handle 5 to 75 pounds and diameters up to 20 in. Impellers, blower wheels, fly wheels, fans, pulleys and other parts having no integral shafts are easily balanced.

Magnitudes of unbalance are positively indicated by a large, easy-to-read meter, calibrated directly in terms of unbalanced correction procedures selected. Angular positions are accurately pointed out by a stroboscopic lamp and readable as a location either to remove or add weight. Working areas and controls are designed for operator convenience.

Macdell Sales Div., Balance Engineering Co., 850 W. Lake St., Chicago 7. (Item 15)

Shaper Guard

A new shaper guard—available as an accessory for models MB and GW—totally encloses both cutting knives and the motor spindle when the machine is operated as a shaper. This guard protects the hands of the



operator when feeding material into the cutting mechanism. On previous models, there was no real protection to the operator's hands as stock was fed through the cut. Now, all moving parts—cutting knives and motor spindle—are enclosed by the heavy metal wall of the guard. A provision has been built into the guard to allow for raising the circular wall to a height permitting the user to make a precise setting.

DeWalt, Inc., Lancaster, Pa. (Item 16)

Magnetic Particle Inspector

This new magnetic particle inspection device requires no electrical power. The portable YM-5 Yoke kit finds cracks in magnetic parts or members.

Since electric arcing is impossible, the YM-5 makes practical the inspection of critical parts or welds in hazardous areas. Refineries, chemical plants, and explosives works will find this product useful.

It is further designed for flight line inspection of steel aircraft pro-

pellers and critical parts. YM-5 eliminates the necessity of disassembly, heavy equipment, and electric power for regular inspections.



The unit finds surface and fatigue cracks in magnetic parts, and will be useful in inspection of railway track.

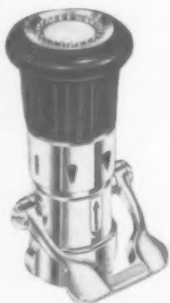
The yoke legs are hinged and the angle-cut tips rotate so that good magnetic contact can be made on almost any shape part.

Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31. (Item 17)

Fog Nozzle

A new type adjustable fog nozzle called the PDQ is equipped with a large protective bumper and is available in either polished brass or chrome plate.

Click-in stops afford easy adjustment for straight stream, narrow or wide fog pattern. Easy-to-read or feel indicators for stream pattern make it possible to pre-set the pattern desired before opening the integral quarter-turn ball shutoff. The handle of the shutoff is designed for easy operation.



The nozzles are equipped with a swivelling "Rocker Lug" base so that the handle will always be in an easy operating position. The nozzle is available in 3/4 in., 1 in., 1 1/2 in., and 2 1/2 in. sizes in various gallonages.

Akron Brass Mfg. Co., Inc., Wooster, Ohio. (Item 18)

Air Line Respirators

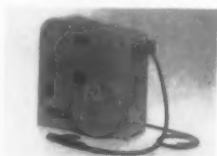
Three new air-line respirators have been developed and are designed for protection in atmospheres not immediately harmful to life, such as welding and cutting fumes, toxic dusts, paint spray vapors and

fumes from molten metals. Two basic types are available—constant flow and demand flow. The equipment includes three types of respirators: the Dustfoe with constant flow; the Comfo Cushion facepiece for either constant flow or demand flow, and the All-Vision facepiece, available with either flow. Blowers, compressors, hose reel, filters, valves, pressure reducers and regulators are available.

Mine Safety Appliances Co., 201 N. Brad-dock Ave., Pittsburgh 8, Pa. (Item 19)

Welding Cable Reel

Model EA welding cable reel handles up to 100 feet of 2/0 cable, at 300 amps. A heavy duty spring and gear mechanism retracts the cable when not in use. The cable may be locked at any desired length by means of a simple locking pawl



arrangement. Construction of the reel permits mounting in any position of the floors, walls, or ceilings or on mobile equipment. The reel was developed to increase plant safety and efficiency by keeping unused cable off the floor and to extend cable life.

United Specialty Corp., P. O. Box 698, El Dorado, Ark. (Item 20)

Spark-Proof Bench Oiler

This spark-proof, push-bottom bench oiler reduces combustion hazards when used around flammable materials. It was developed to reduce the possibility of fire in industrial plants caused from sparks created by the use of regular steel oilers. The oiler has a one-pint capacity, and a nine-inch spout.

Plews Oiler, Inc., Minneapolis, Minn. (Item 21)



Neoprene Coverall

This new one-piece suit is for the protection of workers who are sub-

ject to the splash and spray of oil and acid. The basic fabric is a close-woven cotton, that is Neoprene coated on both sides. The suit is black and has a full length zipper with protecting fly front. It offers full body protection for inspecting and repairing oil and acid equipment, pipe lines, cleaning tanks and vats, and general emergencies.



Industrial Products Co., 2850 N. Fourth St., Philadelphia 33. (Item 22)

Pressurized Water Extinguisher

This light weight, stainless steel, pressurized water fire extinguisher is approximately four lbs. lighter than 2 1/2 gal. brass extinguishers and fills the need for a light, easily portable unit that can quickly be put into action.

The extinguisher is suitable for installation in fire hose and extinguisher cabinets, and is recommended for schools, hospitals, institutions, industrial plants, or wherever a woman or child might need to use an extinguisher. A slight pressure of the thumb releases a strong 35 to 45 ft. stream of water. The liquid can be shut off and conserved as required.

The extinguisher can be pressurized either from an air line or with a portable dry nitrogen recharging unit. A pressure gauge tells at a glance if the extinguisher is in proper operating condition.

Constructed of dent-resistant stainless steel, the extinguisher is hydrostatically pressure tested to 500 lbs. psi.

A brass shut-off valve is easily unscrewed from the dome of the extinguisher by means of a hexagonal nut that can be tightened by hand.



The model is approved by Underwriters' Laboratory and bears the UL-A1 rating found on conventional soda-acid and cartridge-operated water extinguishers.

Fyr-Fyter Co., 221 Crane St., Dayton 1, Ohio. (Item 23)

Electronic Ground Indicator

New improvements have been announced in this recently developed electronic ground indicator. The unit is now UL approved.

The indicator is used by petroleum bulk plant and terminal operators and others who handle gasoline, kerosene, and similar volatile liquids or other hazardous substances. It provides a positive means of draining off static electricity accumulated before and during loading and unloading operations of tank cars, trucks and transports.

Essentially a balanced bridge circuit, the indicator operates on 115-volt, 60-cycle a.c. A miniature-type electronic tube is the power source.



A proper ground produces a minute radio signal, making available a control circuit which can be used to light a pilot lamp, starts pumps, or operate other suitable devices.

Twenty-five feet of standard heavy-duty cable is supplied and a large alligator clip is also furnished. A specially designed retracting wheel for cable protection is available as optional equipment.

Gilbert & Barker Manufacturing Co., West Springfield, Mass. (Item 24)

Saf-T Head Hand Tools

These tools resist spalling or mushrooming when struck. There is less likelihood of a broken tool causing injury.

They are made of high quality tool steel, and are specially treated to produce greater degrees of shock resistance. They are made from tool steel of special analysis, have a balanced alloy content which lends itself to heat treatment, and they are hardened by heat-treating, which permits close control over the hardening temperature, and produce additional strength. Saf-T heads are

designed for spike mauls, cold cutters, backout punches, chisels, center punches, drift pins, and similar types of hand tools.

The Tool & Manufacturing Co., Inc., P. O. Box 10344, Pittsburgh 34, Pa. (Item 25)

Ice-Melting Chemical

This ice and snow melting chemical is said to clear slippery sidewalks, streets and steps up to 30 times faster than salt.



Known as "Ice-Chaser," the new compound is in the form of small white pellets which quickly generate heat and melt through the slippery surface. According to the manufacturer, the pellets spread as they melt, thus removing ice and snow over the whole area.

The product leaves no residue, is safe for vegetation, and is non-corrosive.

It is recommended for use on steps, sidewalks, driveways, streets, parking areas, loading platforms and ramps, railway switches, gutters, down spouts, etc.

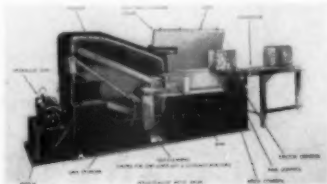
"Ice-chaser," packaged in moisture-proof polyethylene, is available in 10-lb. bags and 400-lb. drums.

Consolidated Paint & Varnish Corp., 1831 Willey St., Cleveland, Ohio. (Item 26)

Scrap Metal Bailer

A light weight scrap metal bailer called the Scrap-O-Matic, is adaptable to all types of industries where bailing of light-gauge ferrous and non-ferrous metals is desired.

The bailer hydraulically com-



presses scrap metal and trimmings into uniform 12x12x12-in. briquettes. The nine cu. ft. charging compartment will take up to 54-in. lengths

of 24-gauge or lighter metal, or steel wire ranging up to 16-gauge. The high speed bailer is designed for one man operation and offers ease and economy of operation and maintenance.

Among the safety devices are a hydraulically-operated, self-locking door control for the charging compartment, and safety-starting push-button switches. The danger of overloading the machine has been eliminated by means of a special by-pass valve which automatically stops the ram cycle if too heavy gauge material has been put into the charging compartment.

The Scrap-O-Matic occupies 48 sq. ft. of area, and requires no pit or anchoring.

Balemaster Div., East Chicago Machine Tool Corp., East Chicago, Ind. (Item 27)

Remote Control TV

This closed-circuit TV installation can be remote controlled, to provide operator safety in hazardous locations, assure undetected operation in security work, and permit quick and accurate viewing of widely spaced objectives.



Called the "285-A Servo System" it includes a multi-lens TV camera which is entirely directed by a separate monitor console. By turning a knob on the console, any function of the TV camera can be achieved. Lenses on the camera are changed, focusing is set, and the camera is directed up or down, right or left, all by remote control. A built-in "memory" in the control console also makes it possible to automatically point the camera in up to three different "pre-set" directions simply by pushing a button. These "pre-set" positions may be readily changed to meet various observational tasks, and facilitate repeated viewing of more than one area or operation.

Dage Television Div., Thompson Products, Inc., Michigan City, Ind. (Item 28)

Portable Dust Collector

This portable dust collecting and shop cleaning unit is designed for industrial wood working shops. It is a powerful, portable, self-contained dust collecting system that uses any standard ash can as its waste receptacle. The "Dust-man" collects saw dust and dust at the machine, thus helping eliminate floating dust in the shop. It is useful for cleaning machines, wood working or metal cleaning displays, etc.



The suction is created by a powerfully designed 8-in. pressure type blower. It is powered by a 1/4 hp., ball bearing, capacitor type motor. It will operate on any 110-120 volt, single-phase system. This can also be supplied for three phase if required.

Craftools, Inc., 401 Broadway, New York 13. (Item 29)

Coated Canvas Work Glove

These new abrasion-resistant, koroseal-coated canvas gloves are made for use on rough surface articles such as concrete rubble, or broken brick, which scrape and grind conventional protective gloves.

The gloves are recommended wherever extra toughness is needed



for handling abrasive materials. The koroseal surface also protects against acids, caustics, petroleum and mineral oils.

The B. F. Goodrich Co., Industrial Products Div., Akron, Ohio. (Item 30)

Plastic Power Line Shields

Electrical power or telephone wires mounted on outdoor poles can be shielded from impact or climbing linesmen by tough pipe made of bakelite polyethylene. The pipe has impact resistance and dielectric

strength, and will not rot, rust or corrode. Easy to install, the pipe is used, for example, to house a lead from a primary cable on the pole cross-arm to the secondary transformer, or the lead from an insulating transformer down to the bracket of a pole-mounted street light.

It can be used to protect ground wires, secondary wiring for a network installation or an overhead to underground service run, among other applications. Moisture, sun light, heat and cold have little effect on the pipe, and it can easily be cut with a saw and bent by hand. The pipe is available in diameters from 1/2 in. to 6 in., in 100 or 300 ft. coils or custom lengths.

Plastic Pipe Div., Triangle Conduit & Cable Co., Inc., Triangle & Jersey Aves., New Brunswick, N. J. (Item 31)

All Purpose Relay

This a.c. or d.c. relay is rated up to 8 amperes, at 115 volt, 60 cycles, non-inductive load. It is a rugged midget relay that incorporates considerable power capacity and multiple contact combinations in small



space. It weighs only 1.9 oz., and the contact combinations are available up to three pole, double throw. Solder terminals are molded in a phenolic block, with barriers for over-surface insulation to meet Underwriters' Laboratories specifications. The manufacturer says that this 1200 relay has become standardized for applications such as automation, computers, communications equipment, circuitry project, remote control units, automatic selectors, electronic controls, and innumerable switching devices.

The unit is also available in a variety of interlock arrangements formed with any combination of a.c./a.c., a.c./d.c. and d.c./d.c. series 1200 relays.

Guardian Electric Manufacturing Co., Dept. 1200, 1621 W. Walnut St., Chicago 12. (Item 32)

Submersible Booster Pump

This submersible type pump has been designed for industrial appli-

cations to provide invisible and noiseless operation, greater safety for people and equipment, extra dependability in any weather, minimum space requirements, and low maintenance performance without need of adjustment or lubrication.



This pump features an oversized shaft, longer bearings with protective cap, perihedral impeller seals, mechanical shaft seal designed specifically for submerged service, and a choice of either mixed-flow or radial-flow impellers. The GE submersible motor has a large oil reservoir and a spring-loaded resilient bag which permits the sealed motor to breathe with changing pressures and temperatures.

Standard models are available from 5 to 150 hp., with discharge head 50 to 500 ft. and 100 to 4,000 gpm. capacity. They are suited to typical sump, line booster, cooling tower, fire protection and barrel pumping insulations.

Layne & Bowler Pump Co., 2943 Vail Ave., Los Angeles 22. (Item 33)

Safety Hammers

This manufacturer announces the addition of two new safety handdrifts to their line of Flex-Flo safety hammers.

The 13 lb. heavy duty handdrift (Model 1300) is primarily designed to be used in set-up work with machine tools, die sets or molds.

Model 250 is a 2 1/2-lb. light-weight handdrift used for controlled tapping.



A specially designed hollow chamber, lined with a series of precalculated wall corrugations prevents head mushrooming under impact.

These safety handdrifts are designed to overcome the hazards of dangerous improvised hand mauls.

Safe, accurate, gravity-aided single-handed blows in confined or limited work areas are easily performed. Additional features include: rivet-lok pinning of the head, contour-cut, non-slip handle, and non-chipping and non-sparking characteristics.

The Cushman Corp., 1228 Ulica Ave., Brooklyn 3, N. Y. (Item 34)

Flame-Resistant Curtains

Flame-resistant curtains and blankets, made from impregnated canvas and designed to provide protection from intense heat, arc flash, molten splash, flying chips and scale, are now available.

The curtains are processed from



8, 10, or 12 oz. duck and from UL grade asbestos cloth in sizes up to and over 100 square feet. The seams are double row stitched; all edges are carefully hemmed, and brass grommets are sturdy and firmly fastened. The blankets are made with grommets in each of the four corners, unless the blankets are unusually long or specifications call for special treatment. The curtains generally include grommets placed one foot apart on one long side.

Eastern Equipment Co., Inc., Willow Grove, Pa. (Item 35)

Corrosion Control

A new corrosion control method, called the Cath-O-Chem system, has been developed. It is especially for stopping corrosion of the submerged metal surfaces in fire protection water storage tanks.

The system combines cathodic protection with chemical treatment consisting of the addition of a particular dosage of specific non-oxidizing salts or colloidal substances to the water. This chemical treatment is said to reduce the installation and operating cost of cathodic protection, and also to assure a better and more consistent distribution of protective current to all of the submerged metal surfaces in the storage tank.

Electro Rust-Proofing Corp., 30 Main St., Belleville 9, N. J. (Item 36)

News Items

Jomac, Incorporated, Philadelphia, manufacturers of industrial work gloves, has announced the appointment of Michael A. Miller as sales



representative in the Chicago area. He was formerly assistant regional manager for the Worthington Corp. of Chicago. Prior to that he was with the American Brass Co.

American Chain & Cable Co., Inc., recently announced a \$500,000 addition to its factory at Adrian, Mich. The new facilities are scheduled for completion early in 1956. The Adrian Division manufactures automobile emergency brake controls, aircraft controls, stainless aircraft terminals and heavy duty emergency brakes.

Ward H. Andrews has been appointed resident sales representative for Protective Equipment, Inc., Chicago. Mr. Andrews has attended the University of Illinois Extension Division in safety engineering, the Safety Training Institute of the National Safety Council, and has served as safety engineer for the Rock Island Arsenal, safety director for



the Maytag Company, and safety director for J. I. Case Company, Bettendorf Plant.

He is a member of the Central Illinois chapter of the American Society of Safety Engineers, a member of the Executive Committee, Automotive and Machine Shop Section,

National Safety Council, and has served as vice-president of the Industrial Safety Association of Iowa.

The Pittsburgh Plate Glass Co. recently announced the retirement of Clarence M. Brown as chairman of the board.

Harry B. Higgins, president, Pittsburgh Plate Glass Co. since 1944, will succeed Mr. Brown as chairman of the board. David G. Hill, vice-president in charge of glass manufacturing was elected president.

The company also announced that the number of directors was increased from 11 to 12 and C. Robert Fay, vice-president and comptroller, was elected to board membership.

Mr. Brown, the retiring board chairman, had been with the company since 1895. He was elected director in 1905 and served continuously for 50 years in that capacity.

Mr. Higgins, the new chairman of the board, has been associated with the company since 1905. He was elected vice-president in 1942 and has served as president since January, 1944.

James D. Smith, Jr., who has been associated with H. Childs & Co., Inc., Pittsburgh, Pa. for the past five years has been assigned as territorial representative for their Iron Age Safety



Shoe Division. He will have headquarters in Gadsden, Ala., and will cover the states of North Carolina, South Carolina, Tennessee, Georgia, Alabama, Florida, Mississippi and parts of Louisiana and Arkansas.

Hubert B. Smith has been appointed director of product engineering at the Claymont, Del., plant of the Colorado Fuel & Iron Corp. He will supervise production at the plant in all stages from the research and development of products and processes to the control of quality.

Mr. Smith was formerly a vice-president of Great Lakes Steel Corp. and at one time was chief metallurgist for Otis Steel Co.

Charles L. Foote, president, H. M. Sawyer & Son Co., manufacturers of rain wear, protective clothing and coated fabrics, has announced the promotion of Laurence Kogos to the position of technical director, and Zavan T. Khachadorian to the po-



sition of chief chemist.

Both men are graduates of Northwestern University, and have been with the company in various technical capacities since 1947. Both will

headquarter at the Watertown, Mass., plant.

* * *

Walter Kidde & Company, Inc., has acquired J. H. Scharff, Inc., of Orange, N. J. and the Mohawk Electrical Co. of East Orange, N. J. Scharff fabricates and sells Atmo fire detection equipment and a spot fire detector and Mohawk manufactures a diversified line of electrical equipment.

It was also announced that the Walter Kidde & Co. of Canada, Limited, has moved into a new building at 5500 Royal Mount Avenue, Montreal, Canada. Located near downtown Montreal, the structure comprises 20,000 square feet of floor area.

Illinois Names State Safety Education Commission

APPOINTMENT of the members of the Safety Education Commission and the superintendent of the new Division of Safety Inspection and Education in the State Department of Labor has been announced by Illinois Governor William G. Stratton.

These new positions are created by H.B. 1085, passed by the 1955 session of the state legislature. This law repeals the Factory Inspection Act and provides for the inspection of factories, commercial establishments and other work places. It also creates the position of superintendent of safety inspection and education and

a Safety Education Commission, composed of three representatives of employers and three representatives of employees.

The Illinois Manufacturers' Association along with the four other principal state employers' associations, the Chicago Chapter of the ASSE, and the Greater Chicago Safety Council made recommendations to the governor and the director of labor concerning appointment of employer members of the Safety Education Commission and the superintendent of safety inspection and education. The governor appointed the following men who were recommended by these groups:

Representing employers:

William O. Wilson, manager of safety, Standard Oil Company (Indiana), Chicago.

Arthur R. Graham, supervising engineer, Bituminous Casualty Corporation, Chicago.

Frank A. Gerard, safety director, Olin Mathieson Chemical Corporation, East Alton.

Representing employees:

Michael J. Kennedy, business representative, International Broth-

erhood of Electrical Workers (AFL), Chicago.

Emmet Kelly, secretary-treasurer, Amalgamated Meat Cutters (AFL), Chicago.

Thomas C. Jackson, president, Local 794, UAW-CIO, Caterpillar Tractor Co., Peoria.

The function of the commission is to advise and to consult with the Department of Labor and the Division of Safety Inspection and Education with respect to the organization of such division and in the development of safety education training programs for employees of the department and private employers. The commission shall define the duties of and set standards and qualifications for the positions of safety advisers and safety supervisors.

George W. Harper, associate professor of mechanical engineering at the University of Illinois, was appointed superintendent of the Division of Safety Inspection and Education. He will act as chairman of the Safety Education Commission. There was considerable pressure to make this a purely political appointment but the efforts to obtain the appointment of an experienced safety engineer were successful. It is hoped that the commission and the superintendent will be able to effect a definite improvement in the operation of the safety activities in the State Department of Labor.

DOSIFILM RADIATION SAFETY BADGE



- ACCURATE READINGS
- LATEST SCIENTIFIC DESIGN
- SPLASH PROOF AND LIGHT TIGHT
- POSITIVE IDENTIFICATION

A personnel monitoring service for users of x-ray or isotopes. Monitoring instruments also available. Radiation safety courses conducted—hazard surveys made.

For further information write to Health Physics Department.

R-C SCIENTIFIC INSTRUMENT COMPANY, INC.

307 Culver Boulevard
Playa Del Rey, California

Reprint on Vision

The Council on Industrial Health, American Medical Association, 535 North Dearborn Street, Chicago 10, announces the availability of the reprint, *Estimation of Loss of Visual Efficiency*, published in the *AMA Archives of Industrial Health*, October 1955.

The article details several important changes in methods of appraising vision losses due to accident or disease, and includes a glossary of the technical terminology.

Single copies will be furnished without charge by the Council on Industrial Health. Prices on quantity orders are available through the Order Department of the American Medical Association.

Consultation Corner

—From page 52

wasn't severe, but it has called our attention to an emergency lighting system.

Someone has suggested a sealed beam headlight powered by automobile batteries in a system set up by our maintenance department. Do you have anything on the subject of emergency lighting and what is your opinion as to making up equipment using auto batteries?

Answer. I cannot think of any more important place for an emergency lighting system than in the powerhouse. Some plants depend entirely on the power plant for furnishing heat, water pumps for fire protection, prime moving source, control boards, and circuit-breaking devices between external electrical services and plant equipment. It is important to be able to reach these units immediately in a safe manner and to prevent as much outage as possible.

The National Electrical Code does not recognize automobile batteries as an approved source for emergency lighting systems. These batteries are considered unsuitable because they are constructed to supply heavy currents and the life is limited as compared to types designed for specific emergency lighting periods.

Portable and fixed emergency lighting systems are available that have Underwriters' Laboratories approval. Data Sheet D-248, *Emergency Lighting*, illustrates commercial types of equipment and covers the emergency lighting code requirements, auxiliary emergency lighting sources, sources for temporary outage, and sources for extended outage. Specific mention is made regarding the use of fuel for engine-operated equipment and precautions for using dry-type batteries.

Industrial Gloves Present a Problem

Question. We use a lot of industrial gloves in our plant, all of them furnished by management. Our records show that

workers are constantly turning them in for new gloves because of opened seams, worn spots, or because the gloves have become saturated with oil, grease, and other materials.

In departments where chemicals and processing oils are handled, gloves are turned in constantly because of small cuts that leak or because the protective coating has worn through. These special gloves are quite costly.

Do you have any information about cleaning or salvaging industrial gloves that might help us control this problem?

Answer. First, compile a list of gloves being used by type, department, and operation. Perhaps the open seams, abrasions, and oil soaking are caused because the wrong type gloves are being used.

Discuss the problem with the glove manufacturer and determine the proper type for each operation, then mark them accordingly. Your storeroom should be instructed to issue the proper gloves per markings and to avoid substitutions or changes at the request of the worker.

Several outside services specialize in reclaiming cotton, leather, leather palm, rubber, neoprene, goat skin and asbestos gloves. They inspect your old gloves carefully and repair them by restitching, sewing in a patch, or reinforcing worn spots with an additional layer of the same material. Then the gloves are reshaped on heated forms to prevent shrinkage. All rough seam edges are smoothed out, the gloves are restored to original softness, and then tied in pairs and returned in containers.

Gloves used for oil, acids, and alkalis are cleaned, reshaped, patched, and then reglazed or coated. They are rolled to prevent cracking and returned. This service can be used with a scheduled pickup and replacement.

Several of these concerns have their own laboratories and will analyze and develop coatings for your operations. They will process free of charge a trial order of dirty gloves which you intend to discard because of the soil or damaged condition.



Traffic SAFETY MIRROR

- Eliminate traffic accidents at blind corners inside and outside your plant —also at loading platforms.
- Traffic Safety Mirrors are available in convex or flat glass.
- Mirrors are easily installed and adjustable

WRITE FOR FOLDER and PRICES

ROUND CONVEX MIRROR SIZES 13" x 18" 26" x 36"	FLAT RECTANGLE MIRROR SIZES 6" x 14" 14" x 18"
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SILVER TROY Company
 Mfgs. of Specialty Mirrors for Industrial Use
 92 Lock Street Newark 4, N. J.

You Can't Fall IT'S A LIFE SAVER



It locks automatically—instantly—holds. SAFETY DEVICE FOR LADDERS

Prevents death and injuries from falling.

Inexpensive. Easy to install. Clamps to any rung ladders, peg ladders, pole or frame. No welding or cutting.
Automatic. Positive. Will catch workman if he starts to fall even if unconscious.
Simple to operate. No upkeep. Requires no attention from climber.
Notched rail hot dipped galvanized. Entire equipment rust and corrosion proof.
 In use throughout country and abroad for approx. 6 years.

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SAFETY TOWER LADDER CO.
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TRADE PUBLICATIONS

These trade publications will keep you up-to-the-minute on new developments in safety equipment and health products. All catalogs are free, and will be sent without obligation. Just circle publication number on the Reader Service Postcard.



1. Safety Tank Car Platform: Bulletin describes an unloading tank car platform developed for railroads, chemical and petroleum companies. Bulletin tells how this platform eliminates dangerous hazards of working on slippery tank car tops. Nichols Engineering Co., 3816 W. Grand Ave., Chicago, Ill.

2. Fire Hose Reels: 16-page catalog describes hose reels for fire-fighting equipment, with illustrations of various models and cutaway view showing component features. Specifications, as well as descriptions of operational advantages are included. Clifford B. Hannay & Son, Inc., 125 W. Main St., Westerlo, N. Y.

3. Improved Dust Filters: 16-page Bulletin 528-R gives information on continuous automatic dust filters available housed or unhoused for use on pressure or vacuum. Explains principle of cleaning the filter cloth with high pressure reverse jet air, and tells where the filters are being used. Provides comparative test data on these and other type filters; discusses industrial dust control service offered and diagrams some installations. Self-adjusting blow rings furnished with these filters are described in detail. The Day Company, 810 Third Ave., Minneapolis, Minn.

4. Electric Hoists: 12-page Bulletin DH-133-B describes speedway electric hoists of 500 to 4000 lb. capacities. Fully illustrates and explains design features and gives details on suspension and conductor systems. Clearance data, specifications included. Wright-Hoist Division, American Chain & Cable Co., Bridgeport 2, Conn.

5. Rol-Away Hand Trucks: 14-page catalog illustrates and describes this

company's line of hand trucks. Featured are: safety ladder trucks with extra high reach, "ladder-on" wash-tank truck, high deck stock picker, utility shelf trucks, a heavy duty pipe and tubing truck, etc. Complete specifications included. Rol-Away Truck Mfg. Co., Inc., 6143 S. E. Foster, Portland, Oregon.

6. Better Floor Care: This illustrated folder describes products designed to aid efficient floor care. Lists combination scrubber-vac machines, conventional scrubbing-polishing machines, steel-wool pads, applicators, vacuum cleaners, mop trucks and other mopping equipment. Included are waxes, sealers and cleansers. Finnell System Inc., 500 East Street, Elkhart, Ind.

7. Steel Grating and Treads: Bulletin 2486, 16-pages, describes types, sizes and load characteristic of company's line of electroforged steel and interlocked aluminum grating and treads. Points out advantages in design and construction resulting in greater safety, pictures application, and includes specifications, photos and diagrams. Blaw-Knox Co., Grating Division, 2092 Farmers Bank Bldg., Pittsburgh 22, Pa.

8. Thermal Controls: Descriptive information and basic technical data on company's thermoswitch controls are presented in 52-page catalog 400. Generously illustrated, this booklet explains basic principle of the controls and why they are sensitive only to heat. Selection and application suggestions are provided, also ordering instructions. Products listed include cartridge, hex-head, block head, flange head, all-purpose junction box, high temperature and other types of the controls. Fenwall, Inc., Framingham, Mass.

9. Kel-Ray Projectors: Bulletin P-196 describes the new Kel-Ray Projectors for industrial radiography with gamma rays. The text covers the types of spot, hemispheric and panoramic radiographs that may be made, tells how the projectors are positioned for different applications and explains the safety features provided to guard against damage from fire, water, sudden shock and tampering. The brochure also describes available accessory equipment such as exposure calculator, positioning equipment and radiation detecting instruments. Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y.

10. Tramrail Engineering Booklet: A new completely revised engineering and application Booklet No. 2008-L describes in considerable detail stresses developed in various type tracks used for overhead materials handling systems. The problem of track peening and its solution is also covered. Many illustrations show the equipment serving a wide variety of operations. Cleveland Tramrail Division of the Cleveland Engineering Co., Wickliffe, Ohio.

11. Protective Clothing: 10-page catalog No. D-3, illustrates and describes protective clothing for linemen, utilities, railroads, highway, and outdoor service crews. Some of the items shown are: nylon-neoprene suits, waterproof jackets, overalls and pants, jackets for meter readers and linemen, waterproof footwear and protective covers for outdoor storage. John E. Dorsey Co., 80 K St., Boston 27, Mass.

12. 1956 Silicone Reference Guide: The completely new 1956 reference guide to Dow Corning silicone products is available. The edition describes almost 150 of the most generally used silicone products, 18 of which were first introduced within

the last 12 months. The products are grouped by physical form (fluids, compounds, greases, resins and rubbers) and cross-indexed by usage (dielectrics, defoamers, damping media, etc.), enabling them to be located by what they do, as well as by what they are. Thoroughly illustrated with charts, tables, graphs and application photographs. Dow-Corning Corporation, Midland, Michigan.

13. Gas Mask Vision: As a help to buyers of gas masks, this company is offering a special test bulletin which presents the comparative maximum usable vision patterns of leading makes of gas mask equipment. The source material for this bulletin, it is stated, is test data obtained through the use of a Vision Scope which accurately checks all ranges of vision angles for both single and double lens types of gas masks. Acme Protection Equipment Co., 1297 Kalamazoo St., South Haven, Mich.

14. Process Pumps: 20-page, 2-color Bulletin Form 7094-B, fully describes company's line of vertically split, single-stage and two-stage type process pumps. Included are design features of the pumps, dimension tables, cross-sectional and installation views. These units are built in accordance with latest API specifications. Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.

15. "CM" Puller: Bulletin 146-G describes company's new improved "CM" Puller. The puller is a lightweight, portable device operated by a ratchet handle and has a thousand-and-one uses throughout industry for miscellaneous lifting and pulling jobs. Puller is available in capacities from $\frac{3}{4}$ to 6 tons. Chishold-Moore Hoist Division of Columbus McKinnon Chain Corp., Tonawanda, N. Y.

16. "Acid and Caustic Resistant Industrial Apparel": 16-page catalog contains a valuable aggregation of news, facts and illustrations relating to the very latest development in acid-resistant and caustic-resistant work clothes made from DuPont Orlon and Union Carbide Dynel. Featured are: pants, shirts, laboratory coats, gloves, underwear, coveralls and jackets. Worklon, Inc., Department 100, 253 W. 28th St., New York 1, N. Y.

17. Audiometric Testing Room: Method of testing employee hearing ability through use of the I.A.C.

standard audiometric prefabricated testing room and a list of results which should be obtained are described in this booklet. Described are safeguards for employers against heavy financial losses caused by increases in insurance premiums. Industrial Acoustics Co., Inc., 333 Jackson Ave., Bronx, N. Y.

18. First Aid Kits: First aid kits, refills, safety equipment and supplies are presented in this catalog. Liberally illustrated, the catalog contains complete descriptions of the various products. A. E. Halperin Co., Inc., 75-87 Northampton St., Boston 18, Mass.

19. Floor Treatments: A free floor survey that will show you how to save dollars in floor treatment costs is described in this bulletin. Detailed is how you can make your floors more beautiful while realizing greater savings in labor and materials. Hillyard Chemical Co., 402 N. 3rd St., St. Joseph 1, Mo.

20. Safety Mirrors for Industrial Use: Bulletin describes safety mirrors designed for use in factories and warehouses where blind corners, cross-aisle intersections, entrances and exits present a safety problem because of traffic accidents. Lester L. Brossard Co., 540 N. Michigan Ave., Chicago 11, Ill.

21. Welding Curtain: Flame and waterproof canvas welding curtains designed to confine the welding operation to a given area are discussed in this bulletin. Eyelets permit attachment by hooks or cords for placement. Salvage covers, used to protect equipment from water, dust and snow, are also covered. Frommelt Industries, Box 165-N, Dubuque, Iowa.

22. Hand Pumps: Applications of hand pumps to transferring liquids on many different types of jobs is discussed in this brochure. Cross-sectional diagrams of pumps with the new measure-type gauge featured. Blackmer Pump Co., Grand Rapids, Mich.

23. Lifting Equipment: This bulletin is divided into four sections: Shop lifters, work lifters, elevating tables and trucks; custom-built hand and electric lifters; drum racks; high-reach maintenance telescopes. 44 pages. Economy Engineering Co., 4511 W. Lake St., Chicago 24, Ill.

24. Emergency Showers: Full operating details of an emergency and

decontamination shower for fire, acid, caustics, radiological, bacteriological and other contaminants are offered in this booklet S-75. Unique features emphasized are the multiple sprays arranged to deluge all parts of the body. The Speakman Company, Riverview Works, 30th & Spruce Sts., Wilmington, Delaware.

25. Signs for Safety: Catalog illustrates and describes company's complete line of accident prevention signs. Complete specifications included. Ready-Made Sign Co., Inc., 115-117 Worth St., New York 13, N. Y.

26. Eye Protective Equipment: A revised catalog of "Eye Savers" products contains many new developments, among them are new ideas in goggle ventilation. They are goggle covers and made of soft vinyl plastic, that can also be used in welding goggles. Other new developments are safety spectacles with high impact protection, and "clip-ons" that can be worn over prescription glasses. Watchmocket Optical Co., 234 W. Exchange St., Providence, R. I.

27. Folding Emergency Stretcher: Bulletin features a stretcher especially designed for first aid and emergency uses; is light, durable and folds compactly. Complete specifications included. Washington Products Co., 238 So. Fayette St., Washington, C. H., Ohio.

28. "Noise Simplified": Booklet contains detailed information on noise measurement and control. The first section examines the relation of noise to hearing. Dangerous noise levels and their effect on hearing are discussed. Techniques of noise measurement including microphone placement correction for background noise and correction for directional effects are also covered. The second section discusses methods for reducing and controlling noise. The final section gives technical data on modern sound measurement equipment. Herman Hosmer Scott, Inc., 385 Putnam Ave., Cambridge, Mass.

29. Self-sticking Markers: Bulletin No. 135, describes self-sticking safety signs. These signs come in a large variety of safety messages on standard color backgrounds. Featured are the "all-temperature pipe markers" that stick permanently to pipes as hot as 300° F. W. H. Brady Company, 780 W. Glendale, Milwaukee 12, Wis.

Leaves air mint fresh!



the multi-purpose
industrial disinfectant
with the fresh mint leaf aroma

MINTOL disinfectant has a coefficient of 9. Diluted half a cup to the pail of water, it meets the new Use Dilution Confirmatory Test.

**KILLS BACTERIA
SANITIZES THE SURFACE
DEODORIZES**

For free sanitary
survey of your
premises ask your
Dolge service man



Leg traction is simple on the new all-purpose stretcher

Here's another use for the versatile new Haggard's all-purpose stretcher kit. No matter what type of stretcher you now have, you have need for the new Haggard. It does all the things any stretcher can do, plus many more. It is a complete unit ready for instant use anywhere. It is so compact that it fits into a car trunk. Lightweight, only 28½ pounds complete with case, blanket, first aid supplies, and accessories. It's such a totally new concept in utility, versatility and practicality that you should investigate it at once. See how easy it is to store, transport, and put to use. See all the advanced, needed features that make it a combination litter, fracture board, traction splint, and resuscitator. Compact, convenient, complete. Ask your MSC distributor for a demonstration or write Medical Supply Company, Rockford, Illinois. In Canada, Safety Supply Company, Toronto 2.

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Here's how it works—

Printed below are two identical Reader Service postcards—the bottom one for your use; the top one for later readers of this issue. The numbers listed on each card are keyed to product advertised and the new safety equipment and trade publications described on

pages 171 through 181. Just circle the items you want to know more about, and we will ask the manufacturer to send you full information without obligation. Both cards are perforated for easy removal, and no postage is required.

New Safety Equipment

Products featured in this section have been carefully reviewed by Council engineers so as to bring you only what's new and reliable in the safety field. Only new safety and health products, or newsworthy improvements in existing equipment are eligible for listing.

Trade Publications

Here's a wealth of helpful trade literature—catalogs, spec sheets, booklets, brochures—that will help you compare before you buy. Whether you are in the market now, or think you may be at a later date, you'll want these valuable references in your safety equipment data file.

Products Advertised

As you read through this issue of the NEWS, you will find advertisements describing equipment that may help you solve some of your accident problems. Instead of making a "mental note," make sure you get full information by circling the corresponding page number on the Reader Service postcard. The letters L, R, T and B locate the ads on the page—left, right, top and bottom. IFC—inside front cover; IBC—inside back cover; BC—back cover.

IMPORTANT—Be sure to fill in your name, organization and address in the space provided on this side of the postcard.

National Safety News, February, 1956

Please send me more information on the items circled below:

FEBRUARY, 1956

(Good until May 31, 1956)

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64	65	86	87T	87B	88	89T	89B	91	93	95	97
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157B	158	159	160T	160B	161T	161B	162T	162B	163	164T	164B
165T	165B	166T	166B	167T	167B	168TL	168BL	168R	170	178	179T
179B	182T	182B	I.B.C.	B.C.							

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64	65	86	87T	87B	88	89T	89B	91	93	95	97
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165T	165B	166T	166B	167T	167B	168TL	168BL	168R	170	178	179T
179B	182T	182B	I.B.C.	B.C.							

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The advertising pages of the News

... your guide to reliable suppliers of worthwhile safety equipment

The advertising policy of the NEWS requires that all equipment and products meet established codes and standards, have the approval of recognized testing agencies, or have proven their value through actual use in industry. Council engineers and technicians screen every

advertisement to make sure that product description is accurate, and performance claims verified by reliable sources. It should not be construed, however, that products advertised are approved or endorsed by the National Safety Council.

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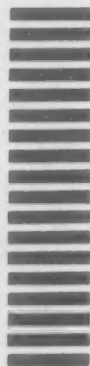
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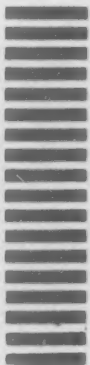
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Before you mail your
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TAKE ANOTHER LOOK AT

- the ADVERTISING pages
- the NEW SAFETY EQUIPMENT section
- the TRADE PUBLICATION section

Make sure all the items you want to know more about are circled . . . check to make sure your name, organization, and address are printed on the reverse side of the postcard . . . THEN mail it today.

National Safety News, February, 1956

CESCO

RIGHT...before your Eyes!



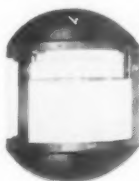
Snap-fast Face Shield
with deflector crown



Open top
Snap-fast Face Shield



Helmet-type Face Shield



Full-visibility
Helmet-type Face Shield



Spark Shield



NEW! CESCO All-Purpose Face Shield *for general shop work*

Here is a practical answer to the demand for a low-priced, light, effective face shield that will meet the demands of a wide variety of shop requirements.

The CESCO 770 Face Shield comes in three window lengths of 4", 6" and 8" (top to bottom). The windows mount inside an aluminum channel in a tight assembly and are impervious to the entrance of dirt or liquid.

The head band of vinyl plastic is adjusted by a sliding strap. There is no metal or mechanical adjustment to snag the hair. The shield conforms easily to the head at all points. Windows of cellulose-acetate may be in green or clear.

Contact your nearest CESCO distributor today or write for complete information and prices.

Write for complete Catalog

CHICAGO EYE SHIELD COMPANY • 2306 Warren Boulevard, Chicago 12, Illinois

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CESCO



FOR SAFETY



F5100
(METAL)

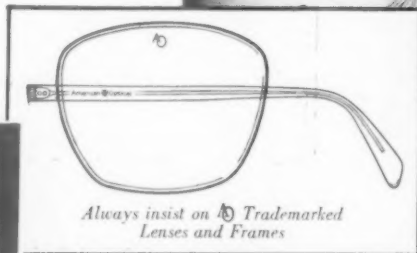
Eye Accident Costs Go Down when **AO[†] Safety Glasses** like these Go On!

The workers illustrated are wearing AO's NEW safety glasses. Because these glasses are comfortable and good looking (as well as of the highest quality) they will be willingly worn. BECAUSE THEY WILL BE WILLINGLY WORN THEY WILL PAY FOR THEMSELVES MANY TIMES OVER IN THE EYE ACCIDENT COSTS THEY SAVE. Your Eye Protection program will pay off!

Have you received your copy of AO's new brochure containing full details on the new F5100 metal and F9500 plastic safety glasses? These glasses have many, many new features . . . in lens shape . . . ultrascopic vision . . . design and engineering. Write for your copy or ask your AO Safety Products Representative.



F9500
(PLASTIC)



Always insist on AO Trademarked
Lenses and Frames

American Optical



SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES
†T.M. REG. BY AMERICAN OPTICAL COMPANY